ADVISORY

DEPARTMENT OF THE IMPERIAL COLLEGE

OF TROPICAL AGRICULTURE.

IMPERIAL MYCOLOGICAL
5 SEPT. 1932
INSTITUTE

REPORT

ON THE

AGRICULTURAL DEPARTMENT,

ST. LUCIA,

1931.

ISSUED BY THE COMMISSIONER OF AGRICULTURE

[Price Sixpence.]

PRINTED BY THE GOVERNMENT PRINTER AT THE GOVERNMENT PRINTING OFFICE,
CASTRIES, ST. LUCIA.

1932.

FORWARDING DISEASED SPECIMENS FOR EXAMINATION.

PLANTS.

A few fragments of a diseased plant are of practically no value for scientific investigation. Sufficient material should always be sent so that the primary cause of the trouble may be located.

Full particulars should be given as to the nature and extent of the damage *done*, the part of the plant attacked, the nature of the soil, drainage, the prevalence of the disease, when it was first noticed, and whether any similar kind of disease has previously been observed in the neighbourhood.

Specimens of portions of plants attacked by fungi may be sent green, packed in a well-ventilated box if the time taken for delivery is under 24 hours, but if delivery takes a longer time, all leaves or soft fruits should be placed in a bottle or corked tube containing a solution made of one part rum or methylated spirit, and two parts water. As many stages of the disease as possible should be sent, with notes as to the nature of each stage.

All specimens should be accompanied by detailed particulars of the nature of the disease, and should be addressed to:—

THE AGRICULTURAL DEPARTMENT,
CASTRIES.

INSECTS.

Observations and specimens of economic importance or otherwise will always be gladly received. The following directions should be observed in this respect:—

Living insects should be packed with a supply of the plant on which they are found feeding and the box should have some small holes pierced for the purposes of ventilation. These should be carefully packed in such a way as to prevent their becoming crushed in transit.

If it is desired to preserve specimens they should be put up in bottles with tightly fitting corks. Methylated spirits, diluted rum, etc., make excellent preserving fluids.

Scale insects, etc., should be forwarded on the portion of the plant on which they are found.

If in doubt as to the best method of forwarding specimens, a letter should be sent asking for instructions and stating full details.

In all cases full particulars should be forwarded as to the nature and extent of damage done, along with any other important points that may have been noticed.

All specimens should be addressed to:—

THE AGRICULTURAL DEPARTMENT,
CASTRIES.

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COLLEGE OF TROPICAL AGRICULTURE.

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1932.

LETTER OF TRANSMITTAL.

THE IMPERIAL COLLEGE OF TROPICAL AGRICULTURE,
AGRICULTURAL ADVISORY DEPARTMENT,
TRINIDAD,

C.A. 1731. 22nd March, 1932.

Sir,

I have the honour to transmit herewith the report of the Agricultural Superintendent on the working of the St. Lucia Agricultural Department for the year ended 31st December, 1931.

2. The report follows the lines of previous annual reports in recounting the routine work of the Department for the year and it is observed that that work appears to have been satisfactorily carried out.

3. The appointment of an Assistant Agricultural Superintendent after a lapse of some years should result in an increased volume of work. There is much to be done in St. Lucia and the lack of staff has been a decided drawback.

4. The provision of a Government Marketing Depot and the appointment of a Manager provides a much needed organization and this together with cool storage facilities should be a valuable help in the development of the trade in fruits and vegetables for Northern Markets.

5. These efforts are greatly assisted by the advice of the Marketing Officer provided by the Colonial Office.

6. The Experiment Station at Union continues to develop. The plant distribution for permanent crops in 1931 fell short of that for 1929 by a wide margin. This it is observed is due to the heavy output of coffee plants in 1929, which appears very largely to have satisfied the demand.

7. The notes on Forest Conservation and Improvement of Live Stock are useful. These are lines of work which seem to offer possibilities of development.

8. It is noted that the Agricultural Department is still functioning in the collection of instalments and rents in connection with the Reunion Land Settlement. This is not a line of work which should fall on the Agricultural Department.

I have, &c.,

H. A. BALLOU,
Commissioner of Agriculture,
Imperial College of Tropical Agriculture.

His Honour
The Administrator,
St. Lucia.

1932—342.

STAFF OF THE AGRICULTURAL DEPARTMENT, ST. LUCIA.

E. A. Walters, F.R.H.S., F.R. Met. Soc. ..	Agricultural Superintendent, Land Officer & Chief Fruit Inspector.
A. F. Nichols, D.I.C.T.A.	Assistant Agricultural Superintendent and Fruit Inspector.
R. W. Niles	Agricultural Instructor and Fruit Inspector.
G. M. Glasgow	Agricultural Officer and Fruit Inspector.
E. L. Daniel	Foreman, Union Station.
R. G. duBoulay	Clerk to Agricultural Superintendent.
Clement Wardrope	Foreman, Botanic Gardens.
Simon Joseph, George Hinds	Plant Inspectors.
W. Arthur Lewis	Copyist.

Government Marketing Depot.

J. R. L. Johnson	Manager, Government Marketing Depot.
Julius F. Girard	Clerk and Chief Packer.

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SAINT LUCIA.

Report on the Agricultural Department for the year ended December 31, 1931.

WORK IN THE BOTANIC GARDENS, AND OBSERVATIONS ON PLANTS.

The weather for the year 1931 was particularly wet during the latter half of the year and heavy rains were experienced throughout the rainy season. The Botanic Gardens were not seriously flooded, however, owing to the very serviceable concrete canal constructed in 1930 which has proved of great benefit. Furthermore the gradual drying up and consolidation of the wetter parts has permitted the renovation of lawns and roads, which are now presenting a more satisfactory appearance. This has been helped by the planting of Casuarina and Eucalyptus collections which have assisted drainage and have grown well, some species notably *E. maidenii* attaining a height of eighteen feet in twelve months. This species is very ornamental and flowers freely, the flowers being strongly scented and attractive to bees. The more conspicuous beds and borders have been replanted with hardy plants such as Crotons, Acalypha, Allamanda and Cycads, which were transferred from the site of the Cold Storage building and satisfactorily re-established.

As a precautionary measure owing to soil subsidence, a fine specimen of *Eucalyptus alba*, 90 feet high, and planted in 1890, was removed, and the tree yielded 115 cubic feet of excellent timber valued at the hardwood rate at approximately £20. Severe pruning of dangerous boughs of the shade trees, *Ficus benjamina*, was necessary owing to disease and wet weather fractures.

The nursery shelters were replaced by a neat structure of concrete and iron, which facilitates watering and weeding. The propagating shed was renovated and enlarged to give more satisfactory working conditions.

As usual a supply of ornamental plants, vegetable plants and seeds was maintained for sale and distribution at the Botanic Gardens. The upkeep of decorative plants and trees in Columbus Square, Castries, was undertaken by the nursery staff and a selection of flowering and foliage plants replaced the indiscriminate collection of large trees previously grown.

PLANT AND SEED INTRODUCTION.

The undermentioned seeds and plants were presented to the Department, and are gratefully acknowledged :—

Soybeans; *Aleurites montana*; and *Theobroma cacao* by the United States Department of Agriculture; a collection of soybeans by the Department of Agriculture, Bermuda; Black Pepper seeds by the Department of Agriculture, Madras; Teak and Cedar seeds by the Conservator of Forests, Trinidad; budwood of various varieties of citrus, including "Foster's pink" grapefruit by the Commissioner of Agriculture, Trinidad.

In addition the following were purchased :—

Lemon budwood, New Zealand flax suckers (*Phormium tenax*) "Red Spanish" pineapple plants, and supplies of vegetable seed.

PLANT PROPAGATION AND PLANT DISTRIBUTION.

The facilities of the plant nurseries were in full demand throughout the year and a large increase in most planting items is to be recorded. This was particularly evident in those orchard trees which are the most expensive and difficult to propagate, and special importations were made to replenish and enlarge the propagating material, viz., sour orange seeds for stocks, citrus budwood, and pineapple suckers for nursery work. A substantial supply of most material is now on hand and a fuller programme has been laid down for plant distribution in 1932. The prices of plants have been reduced with improved nursery organisation, and the local planter now obtains most plants at one-third of the production cost.

The following schedule compares the quantity and kinds of material distributed for the last five years, and is a barometer of the planter's willingness to maintain, enlarge, or change his crops :—

Plants, Seeds and Cuttings distributed by the Agricultural Department during the five-year period 1927—1931.

	1927.	1928.	1929.	1930.	1931.
Lime seedlings	10,385	3,870	19,661	14,585	7,687
Budded and grafted limes	2	64	312	2,467	296
Sour orange seedlings	...	...	. .	1,110	8,405
Budded oranges	201	251	306	582	512
Budded grapefruit	...	30	235	521	1,265
Budded lemons	...	...	...	86	392
Grafted mangoes	154	118	138	116	102
Grafted avocados	...	4	256	158	123
Pineapple plants	...	812	1,253	81	5,012
Coffee plants	150	...	55,150	1,665	7,300
Coconut plants	...	46	119	86	...
Dwarf coconuts	...	...	18	33	4
Claret nuts	...	125	22	14	...
Kola plants	...	...	300	...	...
Grafted nutmegs	...	...	62	57	5
Papaw plants	20	2,015	1,690	530	...
Bay plants	72	...	...	...	...
Total Orchard Plants	10,984	7,335	79,522	22,091	31,103
Cane plants	6,100	6,919	72	5,895	39,594
Sisal plants	...	...	4,274	...	...
Forest plants	507	761	120	225	1,878
Vegetable seedlings :—					
Tomato					9,415
Cauliflower					430
Eggplant	300	...	2,369	4,287	2,191
Sweet pepper					1,792
Miscellaneous					1,550
Miscellaneous plants and cuttings ...	7,161	425	82	150	120
Total Economic Plants	25,052	15,440	86,439	32,648	88,073
Vegetable seeds	22	114	22	18	19
New sweet potato cuttings (bundles) ...	...	...	...	...	5
Green dressing seed (lb.)	25	...	248	160	119
Green dressing plants	125	...	...	...	...
Fodder plants and grasses (bundles) ...	450	...	12	226	55
Ornamental plants and cuttings... ...	326	389	780	285	491

As shown above, the total of orchard trees sent out during the period shows a progressive increase on the more permanent crops such as citrus, mangoes, etc. The production of seedling, budded and grafted limes for 1931 was however smaller than for the previous year, being influenced by lack of orders owing to the depressed market for lime products, and to some extent by the cost of plants, and concentration on grapefruit planting. A sharp increase in the demand for lime plants again occurred in December, and every plant budded or seedling, was eagerly snapped up, and some private nurseries started. Such a fluctuating demand renders nursery work very much of a gamble, and it is hoped that the demand will become more uniform, and permit the necessary maturation of plants which otherwise are lost after planting out. The loss so occasioned has been above 40 per cent., and although now reduced, it is still much too high. This applies also to sour orange stocks distributed for planting and budding *in situ*, and budding in future should be carried out in nursery beds only. Interest in the Florida grapefruit "Marsh Seedless" and "Duncan", and in "Foster's Pink" has increased with the fruiting of the original trees, and a larger distribution is being prepared for. The Marsh variety only is distributed to smallholders, and this variety represents 80 per cent. of the total grapefruit distribution.

The large increase in pineapple plants distributed was due to supplies of the "Red Spanish" variety obtained from Porto Rico, the remainder of which are being propagated by the section method discribed in the Annual Report for 1929.

The increased distribution of sugar-cane plants was due to release of new Barbados varieties and the resumption of the Dennery cane cultivation. The Java varieties have arrowed freely and are subject to heavy infestation by the small moth borer, consequently these varieties are falling into disfavour.

The raising and distribution of vegetable seedlings such as tomato, egg-plant, cabbage and sweet pepper is a new departure, and is an attempt to participate in the winter export trade to Bermuda and Canada. Departmental Nurseries supplying the recognised market varieties now exist in the Soufrière and Dennery Districts, in close contact with the growers.

NOTES ON PLOTS ESTABLISHED AT THE AGRICULTURAL STATION, UNION.

Citrus Orchards

Grapefruit.

The "Marsh" variety, with the exception of three trees, has made good growth, although much budwood has been removed. Of the three trees one died after frequent attacks of scale insects, and was found to have a poor root system with a double main root. The others have been inarched with sour orange stocks to stimulate growth. Two trees fruited this year (December) for the first time, and gave fruit of excellent quality. The "Duncan" variety has made little progress although the amount of budwood removed has been small. One tree with a very poor root system died during the year, and eight have been inarched with sour orange stocks. The Duncan trees next to the embankment have suffered from the effects of bamboo clumps nearby, although these have been root-pruned; a new situation and fresh stocks will be prepared. Grapefruit generally will not tolerate shade, and the fruit produced under such conditions is of poor colour and badly marked.

Oranges.

The orange trees have all made good growth, with the exception of

the Trinidad "Lue Gim Gong", the leaves of which show 'frenching', a chlorotic condition resulting in impoverished growth. The tree does not respond to manurial treatment, and plants budded from it have similar characteristics; it is therefore being destroyed.

Limes.

The budded West Indian limes have made excellent growth and have borne a good crop. The trees are of handsome appearance with a single main trunk. The sour orange stock gives a vigorous constitution, and although withertip disease was prevalent during the wet weather, the crop was little affected, the trees flowering well and setting fruit free from anthracnose. The Trinidad hybrid limes have made satisfactory growth, but hybrids Nos. 5 and 7, with the exception of one tree of each, were removed as being useless for propagation or as parents, and were replaced by one Foster's Pink, one Duncan and one Marsh grapefruit, five Villafranca, four Eureka and five Lisbon lemons.

Bananas and Manila hemp were maintained for shade, and are now being reduced to obviate competition with the citrus trees.

Intercrops.

Pineapples were grown between the rows as in the previous year, and are well suited to this arrangement. The "Sugar Loaf" variety propagated by sectioning three or four rhizomes and planted in June 1929, has made excellent growth; the plants are ninety in number and about 18 inches high, and will fruit in 1932. The rest of this area was planted as a nursery for the 11,799 "Red Spanish" pineapple plants obtained from Porto Rico, of which 5,000 have been distributed. The remaining plants have made excellent growth and will be reduplicated to obtain cheaper material for distribution.

The area of this section has been enlarged, and sour orange, rough lemon and wild Trinidad grapefruit trees have been planted in the extension to provide seed for stocks in the future. *Crotalaria sericea* was used as a cover crop in the orchard rows, and bay leaf mulch has been freely used with good results. The "Chaff" scale was rather prevalent on a few of the grapefruit trees, but it was kept in check by washing with a solution containing 1 lb whale oil soap per 2 gallons water with 1—2% Agrisol.

Orchard Section.

The mango trees have all made excellent growth and have supplied all the scions for the grafted mangoes distributed. The Graham mango has made very rapid growth and fruited for the second time, the fruits being very variable in shape and size, weighing from 1 to 2 lb each. The fruits resemble the Imperal mango in shape and are juicy and sweet, with a faint taste of turpentine. When ripe the skin is light green to yellow, and the flesh is golden in colour. The trees flower in February or March and the fruit ripens rapidly in July or August. From its bulk and consistency the fruit would probably not ship very well.

Oranges: One "Late Valencia" tree died from faulty grease-banding caused by inferior grease lodging on the trunk. American oiled cloth has been adopted to prevent this in future. The other orange trees have provided budwood throughout the year, and have been increased by four Temple, two Lue Gim Gong, one Parson Brown, and two Late Valencia. Most of the budwood trees have been given a temporary rest to mature a larger amount of wood for use in 1932.

Avocado Pears: The selections have all made rapid growth, that of the Fuerte being particularly vigorous; the trees acclimatised well and have a distinctive appearance; their fruiting is awaited with interest, and should take place next year.

Limes: The Woglum limes have made good growth and 7 of the 9 trees have produced fruit; the fruit is larger than that of the West Indian lime, seedless, and shaped like a lemon. The Tahiti limes have made little growth. The orange trees have required periodic washings with the Agrisol-whale oil solution to control the chaff scale, and grease-banding to control stinging ants. Pen manure and 3 lb. of a complete fertiliser consisting of a mixture of sulphate of ammonia, sulphate of potash, and calcium phosphate, in the proportion of 6 : 5 : 6, have been applied at intervals to each tree.

This area which has supplied most of the budded and grafted plants distributed this year has been somewhat overstocked, and consequently Scab disease became prevalent. Improved drainage, particularly of the surface soil, and occasional spraying with Bordeaux mixture was found to be beneficial; the area is now being rested and green dressed.

Scab disease did most damage on sour orange seedlings under 10 inches high, and a better control has been obtained by growing the seedlings in areas free from scab and under drier conditions.

Coconut Plot.

Three of the Malayan dwarf coconuts have fruited and now carry seednuts, and all plants are in a healthy condition. This area has been covered with *Crotalaria sericea* and *C. usaramoensis* and these green dressings have been very successful in controlling Johnson grass *(Andropogon halepensis)*. Furthermore scale insects have not been troublesome. The local varieties of coconuts are making healthy growth, but the Pigeon pea and Bengal bean dressings have proved ineffective in controlling Johnson grass, and have been replaced by Crotalaria.

Sugar Cane.

The variety plots of sugar cane have been maintained, the area under P.O.J. Nos. 2878, 2725 and 2727 being extended to meet the increased demand for these varieties. The St. Croix cane S.C. 12/4 was freely distributed following its initial success in the drier soils of Vieux-Fort where it appears to ratoon well. Plants of the three Barbados varieties B 726, B 374, and B 381, which were introduced in 1930 have been distributed, the demand for B 726 being particularly great. All three of these varieties have made excellent growth in the quarantine plots. An introduction of the new B891 has been made and quarantined.

In April the unused canes were crushed locally and produced 72 gallons of syrup. These cane plots are now to be thrown out and fallowed, a new and larger site being available which will also permit elementary manurial trials.

Lime Experiment Plot.

Two and a half acres of the area for manurial experiments have been cleared and drained, and the rows for the permanent lime plants have been cropped with red beans and black-eye peas (*Vigna catjang*) in preparation for planting. Sour orange stocks have been planted at 2 feet by $1\frac{1}{2}$ feet between the rows, and about 7,000 of these have been established for budding early in 1932. Beds of lime seedlings and young stocks have been run in vacant places. As the land had suffered neglect all the plots are being dressed with

bay leaves at the rate of $1\frac{1}{4}$ tons per acre to replenish the organic content, and this should not unduly bias the experimental area as a whole. An attempt is being made to record floristic and soil characteristics for future reference, and it is hoped to arrange for analyses of the soil samples as certain marked variations are already evident. Working conditions have been much improved by the incorporation of bay leaves and by tillage and drainage.

One and a half acres of the land to be used in the withertip experiment have been flat forked, weeded and drained, the costs being recorded. One acre has been planted in Dasheens (*Colocasia antiquorum*) intercropped with black-eye peas, and the remaining half-acre in black-eye peas for the control of weeds and opening of the pasture for further crops in 1932. The traces and inter-rows in the experimental fields are being planted in lemon grass (*Andropogon schoenanthus*) to provide future supplies of organic matter on the spot, on the lines of the Dominica method.

Demonstration Orchards.

Plot 1, Orange.

In order to obtain a regular development of trees in this plot it was found necessary to abandon budding of sour orange stocks *in situ* and standardisation was completed by re-supplying with uniform budded oranges from the nursery. An introduced variety of Lue Gim Gong made very poor growth and unshapely trees (as already mentioned elsewhere), and was therefore replaced with twelve "Temple" oranges. This is a new Florida hybrid (Mandarin Orange) with the Mandarin growth form. The trees are making rapid growth, the branches being of small diameter and similar to the mandarin or tangerine. This plot was completed with 14 Valencia Late, 3 Parson Brown, and 3 Porto Rico Lue Gim Gong varieties. On the whole the trees have made satisfactory growth and have been washed for the control of green scale and grease-banded against ants.

A good variety of plantain is being grown in the orchard rows for shelter, and the land has been intercropped with sweet cassava, sweet potatoes, tanias and beans. A rather poor return was obtained from the sweet cassava because of wet weather, too much vegetative growth being produced, and one-twentieth of an acre yielded only 35 lb. of roots. The imported American varieties of sweet potatoes were again tried, each variety being planted on one-twelfth of an acre without manure. The yields were as follows :—

	Gross weight.	Marketable weight.
Yellow Jersey	165 lb.	92 lb.
Porto Rico	394 ,,	286 ,,
Nancy Hall	202 ,,	110 ,,
Southern Queen	468 ,,	402 ,,
Gold Skin	25 ,,	— ,,
	1,254 lb.	890 lb.

The Yellow Jersey and Gold Skin gave numerous small tubers; the Porto Rico and Nancy Hall varieties cracked badly and rotted; the Southern Queen was more satisfactory, considering the weather, and is productive under local conditions. The value of the marketable crop at one penny per lb. was thus at the rate of £8 18 0 per acre, and the cost of raising the crop was £2 1 4 per acre.

Plot 2, Grapefruit.

On the whole the grapefruit trees have made rapid growth, the Marsh variety being again more vigorous than the Duncan variety. Two Marsh

trees and one Duncan were resupplied owing to poor root development, and a second Duncan was ring-barked by ants following slight gumming. Attacks of scale insects cultivated by the black stinging ant made grease-banding necessary. The trees have been trained into true standard form with a scaffold of branches, and provide an object lesson to growers of citrus. The orchard rows are planted with plantains and bananas and the remainder of the land has been intercropped with sweet potatoes, yams, beans and tomatoes. The yield of tomatoes was 734 lb. valued at £9 3 6 on an area of one-third of an acre during four months January—May. The cost of working was £6 0 4.

Plot 3, Avocado Pears.

The avocados have made excellent growth, the varieties Fuerte and Galvana being fastest growers. The plot has been sheltered with papaws and with bananas and plantains pruned to accommodate the orchard trees. One-third of the plot was intercropped with tanias and green dressed with cowpeas (*Vigna cat-jang*). Three distinct varieties of cowpea—dwarf, tall and black-seeded plants—have been segregated and found suitable for differing crop seasons. The value of the produce reaped on this plot during the year, mainly papaws, bananas, and plantains, was £3 10 0.

Plot 4, Mangoes.

The mango trees, varieties "Julie" (early and late) and "Peach," continued to grow satisfactorily. They were intercropped with black-eye peas which yielded 109lb of shelled peas valued at £1 16 4. The variety, planted during the wet season, proved to be a running, vine-like plant, the ratio of green cover to bean yield being very high: it is useful mainly as a green dressing. On reaping the crop the plot was planted with sweet potatoes during November and December.

The main plot was extended in October and one-half of an acre of land was cleared from bush and planted in sweet potatoes and black-eye peas, followed in December by another acre in sweet potatoes. The newly cleared land will be planted in Foster's Pink grapefruit and Washington Navel oranges to complete the plot in 1932.

All the orchard trees in the Demonstration Orchards have received applications of farmyard manure, and the complete fertiliser, at the rate of 3 lb. per tree.

Flood Damage.

Flood damage occurred on the night of November 21st owing to an exceptional rainfall of approximately 3.50 inches in three hours, causing an overflow through most of the cultivated sections. The damage to permanent orchard trees was remarkably small, only seven orange trees being lost from the demonstration plots. All the plants that had been washed were moulded up within three days after the flooding and bay leaves were spread on the soil where severe erosion had taken place. Elsewhere about 100 sour orange stocks and 30 young grapefruit were washed out in the orchard section and about 2,000 young pineapple plants in the citrus section. A more permanent loss was sustained by the removal of loose surface soil, which has been remedied by dressings of leaf-mould and deposited soil replaced on the washed plants. A Special Warrant to expend £25 on restoring the area was granted immediately, and by the new year a quick recovery had been made throughout.

The following schedule gives a summary of operations, costs and revenue for the period 1931—1932:—

Plot 1. Orchard crop—ORANGE, 1 acre.

Operations.	£	s.	d.	Returns.	£	s.	d.
Weeding, stumping ...	2	9	5	Miscellaneous vegetables ...		17	5
Planting & manuring ...	1	1	6	Sweet potatoes 890 lb ...	3	14	0
Forking & cultivation ...	1	5	4				
Stumping		7	11	(Other crops pending)			
	5	4	2				
Catch crops.							
Planting peas, beans, sweet potatoes, tanias, bananas ...	2	15	9				
Weeding	3	7	3				
Reaping		16	8				
	£12	3	10		£4	11	5

Plot 2. GRAPEFRUIT, 1 acre.

Weeding	£1	3	1	Tomatoes, 734 lb @ 3d. ...	£9	3	6
Planting &c. ...		17	6	Sweet potatoes		16	5
Forking &c.	2	4	4	Peas		5	9
Draining		11	4				
Green dressing		3	2	(Other crops pending)			
	4	19	5				
Catch crops.							
Tomatoes	6	0	4				
Weeding	3	0	5				
Reaping		9	0				
Yams, sweet potatoes, bananas, &c.	9	8	5				
	£23	17	7		£10	5	8

Plot 3. AVOCADO, 1 acre.

Weeding, forking ...	£9	19	11	389 papaws	£2	5	9
Draining		17	3	Bananas & plantains ...		19	3
Cultivation		4	6	Peas		5	0
	11	1	8	(Other crops pending)			
Catch crops.							
Planting bananas, plantains &c.		13	3				
Planting tanias & manuring	2	7	7				
Weeding		5	0				
Reaping		6	3				
	£14	13	9		£3	10	0

Plot 4. MANGOES, 1 acre.

Weeding, forking &c. ...	£1	16	8	Peas, 109 lb	£1	16	4
Draining		18	8				
Cultivation		4	11				
	3	0	3				
Catch crops.							
Peas	1	1	0				
Sweet potatoes	5	4	1				
Weeding & cultivation ...	1	13	7				
	£10	18	11		£1	16	4

Plot 5. GRAPEFRUIT & ORANGE, 1½ acre.

Felling, stumping preparing and planting sweet potatoes	£19	15	8	(Crop pending)			
	£19	15	8				

Cacao Plot.

The cacao crop was reaped over a long period, January to February giving the main crop when included with December of the previous year; a lighter Easter crop, April—June was made, followed by the beginning of the main or Christmas crop from November onwards. The recorded reapings given below are for the year January—December 1931, and are compared with previous crops:—

Year.	No. of trees.	Total pods.	Pods rat eaten.	Pods diseased.	Pods sound.
1929	308	14,847	6,645	2,958	5,244 (= 4,930 lb.)
			44.8%	19.9%	35.3%
1930	308	7,867	2,717	339	4,811 (= 4,871 lb.)
			34.5%	4.3%	61.2%
1931	305	11,464	3,491	1,287	6,686 (= 5,835 lb.)
			30.5%	11.2%	58.3%

The improvement in reduction of losses from rats has been maintained by keeping the ground and surroundings free from logs and bush, and the loss is now 30·5 per cent of the crop; this is still high, but a portion of this is recoverable if attacked pods are collected early for use. A rise in diseased pods is attributable to continued wet weather during crop formation, and partly to the fact that mulching was neglected through press of other operations. The total wet crop was 5,835 lb., which when fermented and cured produced 508 lb. of cacao sold for £4 11 $5\frac{1}{2}$, or at approximately $2\frac{1}{6}$d. per lb.

Repairs and Extensions.

The main buildings have been kept in fair repair, and accommodation has been maintained for the Foreman and Agricultural Cadets; and a bothy has been repaired for the nurserymen and stock men who are required to live on the Station. Fodder and accommodation for cattle and sheep of the Station have been provided, with serviceable manure pens, and this materially assists in meeting the continuous demand for pen manure.

A 10,000 gallon tank of iron, and an 8 h.p. gasolene engine with centrifugal pump have been erected next to the air-motor pump, to provide an adequate supply of water for piping to the nurseries.

AGRICULTURAL CADETS.

Ten boys remained in training as Agricultural Cadets at Union, five from St. Mary's College, and five from the Primary Schools, until the latter half of the year, when four were dismissed for presistent idling and breaking of rules. For the first half of the year the Cadets were provided with a subsistence allowance of one shilling per diem, with rewards for good work, fines being inflicted for misconduct. On reviewing the results with the Assistant Commissioner of Agriculture in August, the allowance was increased to 1/6 per diem, the fines and rewards being abolished. It has been considered advisable to keep the best one of the Cadets for a 2nd year course, and the other Cadets who have now been discharged will be replaced by three suitable pupils taken from the Primary Schools.

A sum of £78 has now been placed on the Estimates for part provision of the subsistence for four pupils, the balance being drawn from the item "Labour", the total provision, £92, allowing for the keep of one 2nd year

pupil at 2/- per diem and for three first year pupils at 1/- for three months and and thereafter at 1/6 per diem. Better accommodation and rationing arrangements are to be undertaken to improve the status of the boys.

The practical training covered a course of nursery and field work familiarising them with their environment and the use of farm and orchard implements and operations. During the latter half of the year a course of lectures was given covering the following curriculum :—

Soil. Formation and classification. Properties of sand, clay and humus. Drainage and tillage. Construction, use, and care of implements.

Plant nutrients. Farmyard manure. Uses, effects and compatibility of the common fertilisers and lime. Green dressings, mulches and organic manures. Microbiology of soils.

Growth. Seeds, their structure and germination ; storing of seeds. Plant structure and morphology. Assimilation, transpiration, respiration and absorption ; movement of water in plants.

Reproduction. Sexual and asexual reproduction. The chief methods of propagation and care of nursery plants.

Crops. Agriculture of the major local crops. The preparation and application of common insecticides and fungicides.

FOREST CONSERVATION.

Further tours were made in the forest areas, on the conclusion of which a report was submitted to Government outlining certain measures for protection and development of the timber resources. The report was forwarded to the Commissioner of Agriculture who, after considering the proposals in collaboration with the Conservator of Forests, Trinidad, took up the matter with other islands for the formation of a concerted policy, and it is hoped that a survey will be made. The most useful applications of the report are here very briefly recorded for the benefit of local owners of relatively large areas in forest, who themselves can exert a favourable influence on forestry—by care when extending cultivations, on the removal of timber woods, and in the spread of fires ; by replanting new or present species ; and by collecting seeds. In this the Department is very willing to co-operate until such time as a definite plan can be made and put into practice. Supplies of forest seedlings, viz., Teak, Sandal wood, Mahogany, Cedars, Eucalyptus, and Casuarina are planted and available at Union, and more can be raised if demand justifies, and if intelligent use is being made of these.

In 1886 the forests were estimated at one-third of the total area, or approximately 50,000 acres. They are now judged to cover 12,000 to 13,000 acres of Government forest land, or more exactly 13% of the land area, as against the 25% specified as necessary by forest experts for the permanence of climatic and rainfall conditions. This figure does not include private forests, over which no official control at present exists. At present classified as a mixed rain forest, the stand may be improved or degraded according to the treatment applied, the rainfall being adequate for refurnishing if certain precautions are observed.

The following timbers were present in the strip blocks examined in detail, the distribution appearing to be fairly uniform for other parts of the Island : —

Total trees per acre, over 6″ diameter, = 2,725.

Timber varieties = 143 = 5·2% of total.

Species present.	No. of trees.	Per cent.	Demand and condition.
Laurier Mabre ...	23	16	In demand ; no large timber.
Bois Blanc ...	22	15	do. do.
Bois de mas ...	21	14	No demand ; old timber present.
Laurier rouge ...	16	11	No demand ; timber trees.
Chatagnier ...	13	9	No demand ; large trees.
Laurier Canelle ...	13	9	In demand ; medium trees.
Balata	10	7	do. do.
Cypre	9–10	7	do. do.
Laurier petit ficulle ...	7	5	No demand ; old timber.
Laurier noir ...	6	4	do. do.
Miscellaneous ...	2	1–2	
	143		

Other trees in demand, but absent : Red Cedar, Zaboca, Fustic, West Indian Mahogany, Angelin.

The export value of forest products for ten years 1921—30 amounted to £56,443. This includes charcoal—287,849 bags, valued at £17,963. Estimated at 250 bags per acre, this is equal to 1,151 acres cleared and not replanted during the ten year period ; exclusive of local consumption, which is high, but may conveniently be regarded as produced from clearings for agricultural purposes. Charcoal burning competes with cordwood supplies for local factories and is therefore likely to take place increasingly in forest areas.

The measures advocated in addition to those recommended above are thinning and ratooning, prohibition from felling in new regrowth, and gardens in young plots of timber to encourage peasant husbandry of timber seedlings, as practised successfully in Trinidad ; and replanting definitely reserved areas. In some of this work forest owners can co-operate without expenditure if insistence is made on conservation when allotting gardens. Selected species of timbers named above could substitute imported woods, given due seasoning, and other useful trees could be introduced, as already achieved by certain planters and this Department. The amount of imported timber for the ten year period 1921—30 is valued at £28,364.

CONTROL OF INSECT PESTS.

Scale Insects on Citrus and Coconuts.

During the year scale insects were not conspicuous on the major crops where these were under good cultivation, and on the minor crops, mainly citrus trees, they were noticeable because of the more intense examination which has been found necessary to ensure proper establishment of distributed trees. Grease-banding with the proprietary compound provided by the Department has become more popular, and where properly conducted in absence of weeds, has been effective in controlling those larger scale insects which are not carried by the wind, but which are readily cultivated by stinging ants. The effectiveness of this control can be judged by the comparative absence of scale insects above the grease-band, as against the scurfy brown coating of living and dead scales below the band.

On neglected grapefruit, oranges and lemons, the purple or mussel-shape scale, *Lepidosaphes beckii*, was common both on trunks and leaves, being controlled mainly by the white-headed fungus, *Ophionectria coccicola*, and the red-headed fungus *Sphaerostilbe coccophila*; the green scale, *Coccus viridis*, and the red-spotted scale, *Chrysomphalus aonidium L.*, were not so evident. The orange snow scale, *Chionaspis citri*, was evident as usual in lime plantations exposed to wind, and was parasitised by the black fungus *Myriangium Duriaei*. In such positions, the value of shelter growth obtained from planting Gliricidia stakes among limes has been well demonstrated by the spring of new growth, and the reduced die-back of branches.

In one new coconut plantation on heavy land, the absence of proper drainage and soil aeration, combined with a plentiful crop of Para grass, resulted in slow growth and intense attacks of *Aspidiotus destructor*, a thin papery scale insect, and of the star scale, *Vinsonia stellifera*, together with some colonies of the white fly *Aleyrodicus cocois*. Under such conditions not more than one-fourth of the foliage was functioning properly and a rapid drying out and dieback of all the outer leaves took place, the plantation appearing to have been swept by fire. The new management rightly yielded to pressure, and a short time after taking over the estate the worst areas were cleared from coconuts and replanted in cane. Elsewhere in the Island the free growth of parasitic fungi was facilitated by the higher rainfall during the year, and no serious scale attacks were observed.

Cane borers.

The lesser moth borer, *Diatraea saccharalis*, was again in evidence in the Java canes, which seem particularly susceptible to this borer. Other varieties, notably BH 10 (12), did not suffer so severely, and plantings generally were more satisfactory owing to presoaking of the plants in water for varying periods to destroy the larvæ. Soaking for a period of twenty-four hours gives a good control and germination, a longer period tending to cause rotting and loss of the cuttings.

Cane borer Infestation and Parasitism in St. Lucia.

The preliminary report of Dr. J. G. Myers (E.M.B. 42) on the biological control of insect pests in the West Indies has now been received. This is a very interesting treatise mainly on field work, and the important points affecting St. Lucia are commented on below, with due acknowledgements to the author.

Infestation by the small moth borer amounted to 60 per cent. of the stalks examined on the larger estates, as compared with the range of from 90 to 20 per cent. and less in other cane growing islands. Of this approximation it was found that in the larger estates' canes, infestation was from two to four times greater than in peasants' canes. It is possible that this bears some relation to the utility of mixed crops, which by their discontinuity offer no satisfactory breeding ground for such a specialised pest. Cane infestation and the spread of the borer is much facilitated by the alternative grass hosts present in cane fields, traces and roadsides; these are Para grass (*Panicum barbinode*), Sour grass (*Paspalum conjugatum*), Razor grass (*P. virgatum*) and *Valota insularis*; these grasses are able to provide feeding grounds in the temporary absence of cane stalks.

In those estates where clean reaping is not practised, a carry-over of borers will remain in the "leaders", i.e. canes not quite ripe which are left to carry on growth and provide an early springing of ratoons. This practice appears peculiar to St. Lucia, and in view of the borer infestation which it

favours, it is open to question. Field managers state that without leaders, the stools will rot through wet conditions and a short crop will be made. This does not occur in other islands apparently, and it is not practised on the drier Vieux-Fort soils. It is now suggested that the re-arrangement of the drainage system in the cane valleys should permit clean reaping and carting, as drier surface conditions are now becoming evident. Infestation is further enhanced by collecting cane plants for seed from old fields about to be thrown out to fallow. While most managers are aware of this, not all of them reserve their best fields for providing seed canes, consequently the use of infested canes brings in a recurrence of seed failures and dead-hearts, subsequently attributed to adverse soil or varietal characteristics.

Dr. Myers regards the small moth borer as the most serious insect pest of cane throughout Tropical America, and gives as a conservative estimate for the smaller islands a final loss of from 15 to 20% in sugar, from this cause alone.

Parasitic control of Diatraea.

Certain parasites of the smaller borer were found in St. Lucia, but none of them at present exerts an effective control. They are *Microdus stigmaterus*, which is parasitic on the larval (worm) stage of the borer, and exerts a control only to the extent of 4·7% ; the second parasite, *Prophanurus alecto*, is an egg parasite which is not materially effective, since 90% of cane borer larvae die naturally from causes other than parasitism, before entering and boring the stalk. The most effective Trinidad parasite, *Paratheresia claripalpis*, which is parasitic on eggs, larval and pupal borers, is not present in the western wet cane lands of St. Lucia, and its introduction to this area is advised.

The most efficient parasitic fly known, *Lixophaga diatraeae*, was not present in the collections made, and its introduction is regarded as highly advisable ; it is parasitic on the three stages of the borer and effective at the rate of 45%. Its activity extends to borers in rice and weed grasses of the cane fields, and it has been introduced and liberated in Barbados and Antigua, whence it is suggested that an introduction should be made to the similar dry south-eastern cane lands of St. Lucia.

Finally, the value of Crotalaria dressings in thrown-out fields in addition to restoring fertility and preventing the growth of grasses likely to harbour the borer, also extends to parasitic control, since the eggs of the Crotalaria moth are extensively parasitised by *Trichogramma minutum*, a common parasitic fly which also destroys the eggs of borers. Thus the freer use of Crotalaria as a breeding ground for parasitised moth eggs would assist in maintaining a population of egg parasites, although these may be of low efficiency.

The large moth-borer, Castnia licoides.

One specimen of this large and most destructive borer was found in the southern cane fields during the tour. It has not been found elsewhere in St. Lucia, and is not indigenous ; its occurrence however should be carefully watched for, as the losses caused by it in infested countries are put at around five tons of cane per acre, and at 90 per cent. of bored canes. The large borings prove very much more destructive than those of the small borer. The only wild host plant definitely known to harbour Castnia larvae is the common "balisier" or wild banana, *Heliconia Bihai*. This plant is curiously enough not found near the southern cane fields, but is common on slopes of the western estates in St. Lucia. The coarser field grasses may serve as alternative host plants. Control on the mainland in the absence of a satisfactory parasite consists in flooding the fields for seventy-two hours, and in Trinidad the collection of borers and the capture of moths is undertaken to some extent.

Future control of moth-borers in St. Lucia.

On the grounds of economy it is considered that the best control will be obtained by the introduction and establishment of *Lixophaga* to the cane fields, and the further introduction to the western cane fields of *Paratheresia*. The growing of Crotalaria dressings can be advocated on more general grounds, while the soaking of cane cuttings prior to planting would seem inimical to to the spread of parasites, as these would be destroyed together with their hosts. The reduction of grasses in and around the cane fields would concentrate a mor eeffective parasitism in the cane stools.

Coffee leaf-miner.

Of other pests reported on and present in St. Lucia, the coffee leaf-miner was observed as being equally destructive on *Coffea arabica* and *robusta* in the nurseries, but it is possible that estate plantings would be less intensively attacked. This is borne out to some extent in the Soufrière district. No parasites were found, and this suggested that an introduction of a Chalcid parasitic fly from Venezuela or Porto Rico would be of service.

Tomato Green Bug; Hypsipyla borer of Mahogany.

The green, malodorous bug, *Nezara viridula*, was recorded from Crotalarias at Union, though very few specimens could be found. This insect has proved destructive in connection with tomato growing in the Northern Islands, but so far has not been prominent in St. Lucia. The young bugs (nymphs) pierce and suck the green fruits, causing collapse and rotting. Control is exercised by hand-picking, and an efficient parasitic fly, *Trichopoda*, also frequenting Crotalaria, was recorded in other islands.

The *Hypsipyla* borer of mahogany and cedars was recorded on exposed nursery trees at Union. It has been troublesome for some time on estate trees in Soufrière planted for timber (*Cedrela odorata*) which it checks by boring every growing point, causing continual regrowth and distorted plants. This effect is not so severe in trees under more natural forest conditions, and the shoots generally heal and straighten out. At Union where Cedrela and Mahogany are close planted and surrounded by native low forest no attack has been observed.

Dr. Myers also surveys other economic pests including cane root-borers, cacao beetle and thrips, and coconut, banana and ground provision pests, on which no special remarks are needed.

Miscellaneous pests recorded during the year.

Other pests encountered during the year were the common cabbage caterpillar affecting truck crops, and cutworms, slugs, snails and mole-crickets on vegetables generally, for which appropriate control such as hand-picking, poison baits and soil fumigants were advised or supplied.

An intense attack of armies of a brownish-green caterpillar (*Laphygma frugiperda*) on pasture grasses was observed in August, and in a short time certain pastures were cleared of green foliage, leaving only the whitened skeletons of leaf-blades, pasture animals being forced to graze on restricted areas and on shrubbage. Pupation was carried out under shelter afforded by stones and tussocks. A second attack was considerably diminished by parasitic flies the larvæ of which developed as the caterpillars climbed the grasses. The flies then emerged leaving the dead caterpillars fastened to the flowering stalks.

A short tour of investigation into the occurrence of fruit flies was conducted by Messrs. M. Kisliuk and C. E. Cooley of the United States Department of Agriculture on quarantine service, during September. In co-operation with the local Department an inspection of fruits, wild and cultivated, revealed the

occurrence of the West Indian fruit fly, *Anastrepha fraterculus*, in hog plums (*Spondias lutea*). Elsewhere this insect may infest and cause decay of various fruits, e.g. mangoes, star-apples, guavas and citrus, but its presence is not regarded as prohibitory on fresh fruit imports to the United States. As a result of this and other findings, notably the absence of the Mediterranean Fruit fly, it is hoped that mangoes, hitherto excluded, will shortly be allowed importation into the United States.

CONTROL OF FUNGUS DISEASES.

Diseases of Limes and other Citrus.

The Withertip disease of limes was present in a very low proportion during the entire year, and this satisfactory condition is largely attributed to the low rainfall during the flower and fruit formation period, January to June. The increased attention given by means of manurial and mulch applications is however an important factor in the formation of maturing growth and fruit buds, and planters realise that to a great extent and in normal to dry seasons, the effects of the fungus (*Gloeosporium limetticolum*) in destroying shoots or flowers, may be largely offset by well balanced manures, which ensure a regrowth of flowering wood. Irrigation has also its uses in promoting an excess of flowering growth in the dry season, and thus escaping blossom blight; this has been practised with good results on several lime estates.

The year 1931 represents an ideal lime year, and it is instructive to review the sequence of events leading to the production of the crop on the notably successful lime estates, as follows. From December—January to March young healthy spurs were put out progressively, rainfall for the three months 1931 being respectively 0·36, 2·01 and 2·56 inches below the monthly averages for January, February and March for the last forty-two years. In February—March the spurs flowered, the irrigated areas being both the earliest and the most prolific; no disease reported; manuring still in progress. From April to May young fruit were present, and further flowering and foliage growth were made; light showers were frequent, but the rainfall was 0·81 and 2·84 inches below the monthly average. In June rainfall increased, being only 0.75 inches below the monthly average, and fruit swelled rapidly; green lime crop commenced; withertip and some fruit-canker were observed in negligible amount. In late July reaping commenced with a clean crop, rainfall being heavy, 7.96 inches above the monthly average, and remaining in excess until December. The final outcome of the crop was reported as being one-third higher than that for 1930.

Bracket fungi on Limes.

The large, semi-woody, and bracket fungi or toadstools have been frequently found on lime trees when sanitary measures such as the pruning of dead wood and removal of mosses are entirely neglected. *Ganoderma* and *Polystictus* occur generally near the ground on wounds caused by the weeding cutlasses, and constitute a danger since they exhaust the lime bark and produce conditions for the dry dieback of the main limbs. *Schizophyllum* occurs frequently on the smaller branches ringed from scale insect infestation, usually on exposed sites. Sanitation and the use of gliricidia shrubbage are useful in correcting this. On estates where consistent pruning and repairing of wounds is undertaken, these fungi do not become dangerous, but where neglected, they are responsible for a recurring breakdown of tree structure, and are dangerous because of their insidious and largely unsuspected capacity for destruction on a large scale.

A much less destructive fungus regularly brought to notice is a *Septobasidium*, which covers twigs and petioles with a grey-brown felty coating. This is an insignificant parasite readily controlled by removing the affected twigs.

The conspicuous markings known as "greasy spot" have been observed on grapefruit leaves, and occur apparently where the trees have suffered a check, such as when roots become exposed to sunburn. The application of a complete manure and protection of the crown roots seem effective in producing a healthy flush of growth.

Cacao diseases.

Attention was frequently directed to the serious root disease of cacao, *Rosellinia pepo*, on Immortelle and cacao, which becomes prominent as shade removal is undertaken. The removal of Immortelle and the substitution of Gliricidia is advised wherever possible, but gradual shade reduction by heavy pruning is much less disastrous, and the Immortelle lumber can be more effectively burned in small lots, an important sanitary measure too frequently neglected. The exposure of the crown roots of the cacao and dusting with white lime has promoted drier conditions around the trunks, which prevents complete ringing and consequent death of the trees.

Pod diseases such as black or brown rot, associated with wilting of suckers and the young tips of fresh foliage, and with canker in the stem, were evident following the wet months October and November, and caused serious losses. The principal parasite involved, *Phytophthera Faberi*, is dependent on humid conditions, and attention to drainage, removal of excess shade and pruning have been advised. Although the state of the cacao market is prejudicial to an active policy, economic returns from this crop can only be secured by consistent cultivation and disease control, irrespective of prices.

Coconut diseases.

The detailed inspection of coconuts throughout the Colony which was completed in 1930 has left few cases to record for the current year, and these were in areas known as focal sites whence new outbreaks may be started. The reported cases consisted of a few budrots and of stem bleeding disease, and were destroyed by fire.

Sugar-cane diseases.

The cane plantations were not affected with any notable disease during the year. The change-over of varieties is in the direction of canes resistant to gummosis and mosaic, diseases, and a satisfactory position is recorded in respect of both diseases, the former being insignificant and the latter absent from the cane fields.

PLANT QUARANTINE.

The introduction of all plant material was carefully watched during the year, and the following plant material was prohibited and destroyed :—24 lb. corn, 4 nutmeg plants and 8 citrus plants. 148 importations in all were suitably treated and returned to the owners ; no soil was allowed introduction. It is still necessary to reassure the public that such treatments are harmless to the plant or seed and do not effect germination.

The following plant material is not permitted importation into this Colony as it may be the means of introducing diseases or pests :—

1. Coconuts.

Coconuts, coconut plants or any parts thereof from all places, except under licence—vide Proclamation No. 2 of 1924.

2. Bananas.

Banana plants or any parts thereof that may have come directly or indirectly from Trinidad, Tobago, Grenada, Central and South America, Canary Islands, West Africa and Jamaica—vide Proclamation gazetted 8th September, 1917, and Proclamations Nos. 6 and 13 of 1927.

3. Cacao.

Cacao plants from South America, East and South of the Isthmus of Panama—vide Revised Rules and Orders of St. Lucia 1916, Ch. 7, Sec. 2 (*b*).

4. Citrus (Orange, Grapefruit, Limes, etc.)

The importation of all plants of the citrus family is prohibited, except under licence—vide Proclamation No. 3 of 1927.

5. Cotton.

Cotton seed and all parts of the cotton plant are prohibited except under licence, and subject to treatment on arrival—vide Proclamation No. 3 of 1924.

6. Coffee etc.

The importation of all coffee, mango, guava, sapodilla and star-apple plants from the Bahama Islands, Ceylon, Cuba, India, Jamaica, and the Philippine Islands is prohibited—vide Proclamation gazetted 10th February 1917.

7. Sugar-Cane.

All plants of the grass family including sugar-cane, sweet corn, and sorghum, are prohibited except under licence—vide Proclamation No. 6 of 1921.

8. Soil, Containers, etc.

Any earth or any container in which prohibited plants may be or may have been packed is prohibited—vide Revised Rules and Orders of St. Lucia, 1916, Ch. 7, Sec. 2 (*f*)

9. Fruit & Vegetables.

By Notice No. 7 of 1930 under the Authority of the Customs Amendment Ordinance, the importation of soil, fruit and vegetables—except plantains, nuts, onions, Irish potatoes, and canned, dried or processed fruit and vegetables—is absolutely prohibited from all countries other than the British Isles, Canada, and the British West Indies (which does not include the Bermudas, the Bahamas, or British Guiana). All importations from countries permitted must be accompanied by a certificate of origin, stating that the material has not been grown in an area affected by the Mediterranean Fruit fly, and has been inspected, and is free from that pest.

Exportation of Plant Material.

Exporters of fresh fruit, plants and seeds may obtain information on overseas quarantine and certificates when necessary from the Agricultural Department.

DISEASES AND PESTS WITHIN THE COLONY.

The existence of the following diseases and pests should be notified to the Agricultural Department in order to comply with the requirements of the Plants Protection Ordinance :—

COCONUTS—Bud-rot of coconuts.

SUGAR-CANE—Gumming disease of sugar-cane.

BANANAS—Panama disease, marasmius disease, banana weevil and borer.

COTTON—Pink bollworm of cotton.

The presence of the parasites love vine and bird vine should also be reported.

ANIMAL QUARANTINE.

FARM PRODUCTS.

Under Ordinance No. 17 the Governor in Council may prohibit the importation of animals or farm products which may be a means of introducing disease; the importation of animals and farm products from the United Kingdom, Isle of Man, and Channel Islands is prohibited; the importation of parrots and all birds of the species *Psittaciformes* (*Psittacidae!*) is absolutely prohibited.

IMPORTATION OF BEES.

Under Ordinance No. 18 the importation of any queen bee or used bee-keeping apparatus, is prohibited except under certificate approved by the Agricultural Superintendent to the effect that Foul Brood has not existed in the apiary or in connection therewith.

FARM STOCK AND POULTRY.

Interest in farm stock and poultry was well maintained during the year and enquiries for good breeds were dealt with, one Holstein bull being imported from the Government Stock Farm, Trinidad. On the whole the new introductions have done well, and the calves raised from crossing on to local stock of fair character show good form and size, with a strong tendency to the imported breed.

Of native animals, an outstanding specimen of the draught bullock raised on a Soufrière farm has given very creditable results in breeding, and when slaughtered recently, weighed 1,400 lb., being about five years old. The owner of this animal gives personal attention to his stock and contemplates the introduction of several heifers of milking breed for the establishment of a local dairy farm. Good butter made on an estate on the windward coast was on sale towards the end of the year, and has improved as experience resulted in a definite technique. Local cold storage offers distinct advantages for dairy products and slaughter cattle which heretofore did not exist.

The suggestion of running a poultry farm for egg production for marketing in Bermuda was further enquired into and shows doubtful prospects. Competition between Canadian and American exporters is very keen and the eggs are of high quality and definite grades; the prices range from 23 cents to 35 cents per dozen, f.o.b., with exchange normal. Such a trade requires expert handling and might then prove attractive, the temporary advantage of the exchange rate being considerable, while the absence of a winter period here and supplies of cheap food are local factors for cheaper egg production. A smaller trade could be worked up for ships' supplies and possibly intercolonial export, now that local cold storage is available.

Provision of stock under the Colonial Development Grant

The programme for stock farm work under the Colonial Development Grant has been proceeded with and funds for importation of the following animals are available—two pedigree bulls, one Jack donkey, two rams and two boars, and importation will be made as advisable during 1932. Cattle accommodation at the Station has been provided by the reconditioning of an old sugar building with concrete floors and plastered walls, with Eucalyptus hardwood stalls for eight animals, at a cost of £19. The building is now well lighted, ventilated and drained; the whole of the alterations made could be readily undertaken by any intelligent small-holder. External buildings are being provided for small stock. Maintenance will be derived from one and a half acres of Guinea grass already planted, together with chopped fodder and an allowance of local concentrates such as black-eye peas.

Services by the animals will, it is hoped, be readily utilised for cattle of the smaller holders, for whom the grant was made.

VISIT AND REPORT ON ANIMAL HUSBANDRY AND DEVELOPMENT.

In connection with the extension of the stock industry and animal welfare, a visit by the Adviser to the Colonial Office on Animal Health, Mr. R. E. Montgomery, M.R.C.V.S., was arranged during the West Indian tour, and took place on 22nd May. In company with the Assistant Commissioner of Agriculture and the Agricultural Superintendent, Mr. Montgomery visited stock and pastures locally and inspected the local meat market, during the short time available. Further information on general aspects was forwarded by mail, and subsequently a report on the tour was issued by the Adviser; this comments on the condition, means of improvement and co-operation among stock farmers, and is a valuable report which should be read by those interested in stock keeping. As the information is in no way confidential, the report is briefly abstracted here, with special reference to animal development in St. Lucia, in which a revived interest has been noted during the past year or so.

STOCK AND OWNERSHIP.

The number of animals kept in St. Lucia is estimated as follows, no exact records being available:—

Horses	Mules	Donkeys	Cattle	Pigs	Sheep & Goats.
1,000	660	300	8,000	8,000	7—8,000

The view is expressed generally that the present grades of stock are inferior and more degenerate than is warranted, owing to the small-holders and others not taking advantage of services from good sires, mainly under Government control. The indiscriminate use of scrub

males is much too frequent and results in poor offspring. On the other hand controlled mating has resulted in great improvements, and if popularised would have early results.

Cattle.

The "Zebu" so called, an Indian strain used for draught mainly, is common in most colonies. The Freisian and Guernsey breeds are evident in the various strains prevalent in all the eastern islands including Bermuda, and are used for milk production.

Meat is described as too often meaning any animal useless for other purposes, although a few enthusiastic owners have endeavoured to improve on this. The sale for meat of draught oxen after 10—15 years of work is an instance of bad supply, and the means whereby such abuse is possible are given later. Peasant ownership, often limited to a single cow, or with a few pigs, is common, being more definitely an investment among East Indians who are habitually cattle owners and may even possess draught oxen, than among West Indians, who are less cattle-loving. The principal use of cattle apart from milk-production, is for work and manure-making in fly pens on the estates, or permanent sheds in the yards. Several Jamaica owners produce stock for sale as workers, or for beef.

Sheep and Goats.

Of sheep the woolless strain is common, and as with goats, these find a precarious living on roadsides and dry pastures, breeding at will with consequent degeneration and poor types. The Black-headed Persian has been introduced to Trinidad, St. Vincent, and British Guiana. Goat flesh is preferred to genuine mutton, but of the larger number slaughtered few have been fattened.

Pigs.

These are popular among small-holders, and are allowed to feed at will in the holdings, with some household scraps. The type is often stunted and unthrifty through poor feeding, but as pork it is very popular. Government pens for disposal and loan were observed and should be extended, since salt pork is imported largely and could well be replaced by domestic production. (In St. Lucia the importation was 53,349 lb. valued at £1,611 in 1930, a lower figure than usual, and consisted of canned, salted and cured meats,)

PASTURES, FOODSTUFFS AND WATER.

Pastures not infrequently consist of areas unsuited for crop plants, and are usually not treated as a product likely to give a financial return. Consequently the seasonal weathering by heat, rain-wash, and firing to some extent renders its immediate nutritional value doubtful. Over-stocking and uncontrolled weed growth, and the grass return from thrown out areas does not result in a pasture of value. Rainfall, however, being adequate, should facilitate a return of valuable pasture with better management, and this is evidenced in fenced, manured and properly grazed pastures carrying animals in good condition. Certain grasses are utilised for cutting e.g. Guinea grass, Para grass, Elephant grass, cane tops, etc., and are useful supplements to pasturage. Manuring for improvement of Sour grass in Barbados is said to give very beneficial results, and other pasture grasses should be treated similarly. Foodstuffs such as cotton-seed meal, maize, rice, coconut cake and meal, molasses and lime mill residues, are quoted as being local concentrates which should be more freely used in place of imported linseed, bran and other expensive foods. Salt and mineral lime are readily obtainable locally to replace certain mineral deficiencies in pastures.

BREEDING AND MANAGEMENT

Introductions from Government Stock Farms and by private enterprise are likely to improve the present native stock, but absence of any records complicates the valuation of the results obtained. It is suggested that sires should be interchanged between colonies after a number of services have been made, in order to gain the greatest advantage from the selected animals. Private usage of sires on loan to farms is beneficial, but neglect is liable; this could be obviated by stationing the animals at certain centres, around which methods of feeding, breeding, utilisation of products and the keeping of stock accounts would be developed as a demonstration of stock-farming, together with the treatment of diseases.

DISEASES.

Diseases mortality is low, and few outbreaks of importance have occurred. Tick fever is of great importance, being widely distributed, and responsible for the depression of young animals, and a serious menace to imported stock. Dipping is not practised to any extent by peasant owners. Tuberculosis, which is also widespread, is dangerous in relation to an infected milk and meat supply, and effective action to reduce this disease is needed. Swine fever is regarded as being more common than is suspected. Botulism in Trinidad among cattle and equines has proved fatal in certain areas and an investigation now being undertaken on the vector and mode

of transmission should also determine whether man is susceptible to this disease. Parasitic infections cause indirect and some direct losses.

The general view is, therefore, that no serious disease is rife, yet veterinary attention is greatly needed. Facilities for diagnosis and treatment are mostly absent and such staff as exists is fully occupied with routine duties. Meat inspection needs further attention by qualified observers to determine the incidence of disease, as present records provide little advance in the disease problem. The elimination of unnecessary regulations and the inclusion of desirable ones to restrict the spread of disease, whilst permitting freedom of action, is recommended in the revision of the Diseases of Animals Ordinance.

ECONOMIC USES OF STOCK.

An instance of improvement is recorded for the Jamaica Government Stock Farm, where the average milk yield rose from 8.2 pints and 4.54% butterfat in 1920, to 11.8 pints with 4.94% in 1929....Suckling of the calf is common to the peasants, thus the milk obtained for sale amounts to a few pints daily; whereas with suitable feeding rations, calves should be removed at birth.

The quality of meat sold is often poor, since a good carcase obtains no better price than an inferior one. The lack of further means of disposal restricts sellers to sales to itinerant butchers, who also dispose of the meat, purchasing only sufficient for immediate sales. The present purchasing markets, Trinidad and Barbados, are suggested as markets for supplies in excess of local demands, shipped as chilled or frozen meat, as against imported foreign meat. To realise this, better quality meat and continuous supplies are essential.

The utilisation of meat products such as barrelled meat, bacon, ham and lard, now imported, should be developed at convenient export centres, and only under sanitary conditions; this would dispense with the present view that meat will not keep in the Tropics, a view favoured by butchers who realise that a normal shrinkage entails a loss of weight and sales. The value of bye-products obtained would form an asset to such a centre. Milk collecting depots as suggested above could be organised to collect, separate, and pasteurise milk, utilising the products for butter and cheese, and separated milk for sales to the public or for pig rearing. The report stresses the need for organised collection and marketing, particularly with regard to exportable products, thus removing the present barrier of low consumption and indifferent supply, by offering a wider market which would pay better prices for superior meats and products which are at present imported.

The report concludes with recommendations for freer interchange between Veterinarian officers, and the control of biological products such as vaccines to prevent abuse and excessive prices.

The following schedule gives the amount and values of imported products commented on in the report, during 1930, for St. Lucia :—

Animals.

Amount.	Cattle.	Goats.	Sheep.	Swine.	Asses.	Dogs.	Horses.	
No.	26	3	1	5	23	6	1	
£	136	1	1	13	33	4	4	
	Total Value ...			...	...	...	...	£192

Animal Products.

Amount.	Table Butter.	Cooking Butter.	Oleomargarine.	Lard.	Cheese.	
Lb.	15,409	31,616	85,637	33,834	10,088	
£	1,300	1,911	2,047	916	551	
	Meats—				Milk.	
	Canned.	Salted.	Smoked.	Other.		
Lb.	5,957	41,590	11,759	...	4,218	
£	221	974	637	185	139	
	Total Value ...		...	...	...	£8,881

Animal Foods.

Amount.	Corn.	Oats.	Hay.	Miscellaneous.	
Lb.	100	10,900	100	22,214	
£	1	53	1	132	
	Total Value ...	...	...	...	...	£187

Miscellaneous.

Amount.	Lime.	Salt.	
Tons	12	404	
£	44	621	
Total Value ...	...	...	...	...	£665
			£9,925

EXAMINATION OF AGRICULTURAL PRODUCTS.

Report on samples of Quebracho Wood sent to the Imperial Institute for Examination.

The samples which are the subject of this report were forwarded to the Imperial Institute by the Agricultural Superintendent in St. Lucia. They were submitted in accordance with a request by the Advisory Committee on Tanning Materials of the Imperial Institute, who had been considering the cultivation of Quebracho trees within the Empire and considered that it would be of interest to ascertain the age at which the trees could be economically felled in relation to their tannin content.

The samples were forwarded as representing portions of the trunk and branches of a 13-year-old Quebracho tree growing at the Reunion Experiment Station. Botanical specimens from the plantation had been forwarded in 1928 to the Royal Botanic Gardens, Kew, and identified there as *Schinopsis Lorentzii*.

"*Description.*

"The samples consisted of five logs, varying from 8 to 16½ lb. in weight. They were covered with bark which was about $\frac{1}{8}$ inch thick, fairly smooth and greyish-brown externally, and dark reddish-brown on the inner surface. The sapwood was buff-coloured and the heartwood pale reddish-brown. The logs had the following dimensions:—

Log.	*Length.*	*Diameter.*	*Diameter of Heartwood.*
	inches.	inches.	inches.
No. 1 (Base of trunk)	14	6	3
,, 2A (Main branch)	20	4	about 1
,, 2B (Main branch)	21	4¼	about 1
,, 3 (Middle of trunk)	19	5¼	about 1½
,, 5 (Upper trunk)	15	4¾	about 1½

"For the purpose of comparison the Imperial Institute obtained a commercial sample of Argentine Quebracho, consisting of a log of dark reddish-brown heartwood 16 inches long and 10½ to 11½ inches in diameter.

"*Results of Examination.*

"Samples Nos. 1, 2B and 5, which were selected for detailed examination, were found to contain the following amounts of bark, sapwood and heartwood:—

	No. 1 (Trunk)	*No. 2B (Branch)*	*No. 5 (Trunk).*
	per cent.	per cent.	per cent.
Bark ...	9.0	9.3	10.3
Sapwood ...	80.5	83.4	74.1*
Heartwood...	10.5	7.3	15.6*

* No sharp separation of heartwood and sapwood could be perceived in this sample and the figures must therefore be regarded as approximate.

"The bark, sapwood and heartwood of these three samples and the Argentine heartwood used for comparison were analysed with the following results:

	No. 1 (Trunk).			No. 2B (Branch).			No. 5 (Trunk).			Argentine Quebracho
	Bark %	Sap-wood %	Heart-wood %	Bark %	Sap-wood %	Heart-wood %	Bark %	Sap-wood %	Heart-wood** %	Heartwood %
Moisture ...	15.0	9.4	13.3	16.3	9.0	14.0	17.0	9.7	11.6	13.2
Insoluble matter	68.4	85.2	73.7	67.0	86.9	72.5	66.0	84.7	77.5	66.2
Extractive „ (non-tannin)	8.2	3.8	3.6	9.5	3.5	4.5	9.7	4.0	4.0	2.2
*Tannin ...	8.4	1.6	9.4	7.2	0.6	9.0	7.3	1.6	6.9	18.4
Ash ...	5.5	0.8	1.3	4.0	0.7	1.1	4.6	0.8	1.1	0.6
†Tintometer Readings:—										
Red ...	28.2	13.1	5.1	30.3	20.3	5.3	27.2	8.8	4.5	3.4
Yellow ...	62.2	50.0	9.6	82.1	80.0	10.3	102.6	40.6	8.3	6.1

* Carried out by the Official International Method of Tannin Analysis, except that in the case of St. Lucia samples the Procter extractor was used in place of the Koch (Hide Powder Batch C. 3).

† Determined for a solution containing 0.5 per cent. of tannin in a 1 centimetre cell.

** As no sharp separation of heartwood and sapwood could be perceived in sample No. 5, these figures for heartwood must be regarded as mere approximations.

Note.—Samples 2A and 3 were not examined. These were from intermediate positions on the tree, and in view of the above results obtained with Nos. 1, 2B and 5 their analysis was not considered necessary.

Remarks.

"*Heartwood.* The foregoing results show that the heartwood taken from the base of the tree (Sample 1) contained about the same amount of tannin as Sample 2B representing the heartwood from a portion of the main branch, and that the amount was only half that present in the commercial sample of Argentine quebracho heartwood used for comparison. The low amount of tannin in Sample 5, from the upper portion of the trunk, may perhaps be attributable to the difficulty in this instance in distinguishing clearly between the heartwood and sapwood.

"It will be seen that these heartwoods from different parts of the tree all gave rather darker-coloured extracts than the sample of Argentine quebracho wood used for comparison.

"*Sapwood.* The amounts of tannin in the sapwood of the present samples correspond to those stated to be found in the sapwood of Argentine quebracho, viz. 0 to 4 per cent.

"*Bark.* The barks from the present samples gave very highly coloured extracts, containing large proportions of soluble non-tannin matter. They contained however slightly more tannin than the figures (viz. 5 to 6 per cent.) recorded for the inner bark of quebracho trees over 40 years old, the outer bark of which is stated to contain about 2 per cent. of tannin.

"It is generally accepted that a quebracho tree is not suitable for cutting until it is 40 years of age, and the results of examination of the present samples from a 13-year-old tree show that the heartwood (the part of the quebracho tree usually employed) contains only about half the amount of tannin found in the commercial material. This point is of importance as no data are on record for the tannin content of quebracho trees in correlation with age. It is clear from the present results that to cut the trees for commercial purposes when only 13 years would not be a profitable enterprise in competition with the Argentine industry.

"An investigation of logs cut from trees of different ages with a view to determining the tannin content at various stages of growth, and the point at which it reaches a maximum, would be of much interest and might furnish valuable results."

PROGRESS IN THE CHIEF INDUSTRIES.

SUGAR.

The area in sugar-cane was reduced in 1931 by approximately 250 acres owing to the partial absence of a crop in the Dennery Valley, the total acreage being about 4,050 acres, practically all on large estates. The area increased towards the end of the year with the resumption of cane-planting in the above valley, where coconuts, having proved unsatisfactory, are being replaced by the newer varieties of canes. The total production of sugar was therefore lower, the output for the operating factories amounting to 4,572 tons of 1st and 2nd sugars, as against 5,153 tons for 1930. From the three principal factories the crop amounted to 4,136 tons of sugar, and was derived from 43,521 tons of cane, averaging 10.5 tons cane to one ton of sugar. The production of molasses was maintained, being 162,000 gallons, of which only 24,837 gallons were exported, the remainder, 137,163 gallons being converted into rum.

The production of rum was 31,003 proof gallons, none of which was exported during the year, and is a slight increase on the preceding year. The Troumassée distillery has ceased to make rum, as the estate is now established in coconuts. The Dennery factory has been equipped with a still and commenced operations during the year.

The export values of sugar products show a serious reduction on previous years, owing to the low prices obtained, as set out in the following schedule where the economic return is about half that secured for the year 1927—a progressive decline in values reacting seriously on the welfare of the Colony :—

		1927.	1928.	1929.	1930.	1931.
Sugar—						
Production	tons ...	5,364	4,042	4,997	5,153	4,572
Export	tons ...	4,610	4,100	4,536	4,567	3,973
Export values	£ ...	76,434	63,050	51,237	45,289	35,554
Molasses and Syrup—						
Export	gall. ...	156,050	85,784	127,273	157,254	24,837
Export values	£ ...	7,633	3,643	3,047	2,872	1,194
Rum—						
Export	gall. ...	1,700	1,323	2,043	1,583	nil
Export values	£ ...	212	218	339	278	nil

This gloomy picture is only lightened by the fact that the sugar companies have been able to carry on in the face of such depressing values and demand, and the managements are deserving of much praise in this respect. As a fact, the conditions in the cane-fields generally are much improved, and, through careful attention to recultivation, some excellent yields in the region of 27 tons per acre (average) are anticipated for the new crop. New fields have been carefully selected, entirely redrained, and the system of banks improved, and new varieties of the standard cane BH 10 (12) have largely supplanted the doubtful or deteriorating forms. Field dressings for conserving fertility and preventing weed growth have been actively utilised, and the supply of pen manure although reduced has been used to best effect. An arrangement has been made for trials of minimum to maximum doses of sulphate of ammonia on a randomised plot of selected canes, in co-operation with the Agricultural Department, to determine the most economic application based on tonnage and sucrose yields.

As indicated above, the market price of sugar was low throughout the year, varying only from £9 12—£10, Raw Preferential 96° in January —April,

to £10 10 per ton c.i.f. in December, a slight recovery to £10 15 being made on the suspension of the Gold Standard in early October. A short comment on the effect of this financial safeguard on the produce markets is included under "Agricultural Outlook." The increase of local import duty on sugar has assisted growers to some extent, while the operation of the Chadbourne plan which alleviates the general over-production of sugar by allocating a certain quota of production to countries participating in the agreement; and the reduction of the Cuban crop area; together with the prospective movements in the money market, are factors working for the gradual recovery of this key industry.

The Canadian market has evinced interest in local crude molasses, and it is hoped that demand will follow. The absence of any export market for fancy molasses had resulted in an almost complete disappearance of this product. Consequent on this a good price has been offered locally for early supplies and small holders were making syrup as early as October. In replantings of fields opportunity has been taken to provide new, sweet varieties of canes in place of worn out varieties. The retention of this industry among peasants is desirable, as cane syrup is a valuable food which should form part of the local diet, replacing imported sugars and syrups.

CACAO.

This staple crop has been maintained although market prices were exceedingly poor during the year. The crop amounted to 10,419 cwt. with an export value of £14,125, the markets falling from 45/- to 26/- and 32/- in October, following which an improvement in financial affairs brought the closing prices to 32/- and 38/- per cwt. c.i.f. As a result expenditure and operations on the estates were reduced to a minimum, or diverted to lime production, and small blocks of cacao have been cleared and planted with citrus.

The price offered locally for half-dried peasants' cacao, one penny per lb., was no encouragement to care for this crop, and the product was correspondingly inferior. Peasants have been insistently cautioned not to proceed with these small isolated blocks and are replanting with provisions and fruit trees. In a favourable locality bulk fermentation of various collections was instituted.

On the other hand, the preparation of best estate cacao has been improved, and market reports received show that St. Lucia "planters' cacao" has gained a fair reputation and close prices with other fine grades. Such improvement is the only means of obtaining sales, and judging by the operations of the Tobago Co-operative Fermentary, careful attention to preparation and grading can effect market prices favourably to the extent of 2/- to 3/- per cwt. Voluntary grading of St. Lucia cacao would thus readily pay for the trouble incurred, and would assist generally in better and earlier sales.

Cacao growers and exporters should also test the Canadian market for sales, since the Dominion provides a substantial preference—$1.50 per 100 lb. intermediate, and $2.00 general tariff—yet West Indian cacao forms only 25 per cent. of the total imports of this commodity.

The exports of cacao for the five year period are compared below:—

		1927.	1928.	1929.	1930.	1931.
Export ...	cwt.	12,183	11,006	8,906	10,449	10,419
Value ...	£	30,560	27,321	18,864	19,261	14,125

LIMES.

Weather conditions for this crop were highly favourable and a record crop of limes was reaped, the yield showing a return to pre-withertip days.

The total exported crop, calculated on a distilled oil basis only, at 4 oz. per barrel, is equal to 46,308 barrels of fruit, as shown below with production and values for the five year period. Market prices for lime oils were more satisfactory than for the preceding year and these products attracted most attention—varying from 50/- to 40/- and finally 60/- from October onward for handpressed lime oil per gallon, c.i.f.; and from 30/- to 38/- for Distilled oil; heavy stocks with weak demand at the close of the year somewhat reduced this figure.

Concentrated juice was neglected and very little was manufactured locally. Prices ranged from £8 to a record bottom price of £4, subsequently (October) rising to £5 per pipe. Raw juice was practically valueless, much of it being thrown away after extraction of the oils. The price ranged from 1/6 to 3/- per gallon, c.i.f., but owing to the wet summer very few contracts were made. The market for green limes was active and a record export was made, mainly to the United States and Bermuda, prices ranging from 16/- to 28/- per barrel locally. Consignments of green limes provided gratis by growers for advertisement were forwarded, in collaboration with Dominica and Montserrat, to the Canadian-British West Indies Produce Company Limited, and, it is hoped, have stimulated the demand and popularity of this product.

Amount and Values of Lime Products, 1927—1931.

		1927.	1928.	1929	1930.	1931.
Concentrated Lime Juice	gall. ...	38,064	18,028	21,259	16,050	10,312
Value ...	£ ...	8,763	4,998	5,879	2,312	650
Raw Lime Juice	gall. ...	17,509	12,598	40,675	5,140	6,961
Value ...	£ ...	967	631	3,212	183	297
Distilled Lime Oil	gall. ...	995	1,159	685	954	1,145
Value ...	£ ...	9,904	12,261	9,049	10,751	14,524
Handpressed Lime Oil	gall. ...	379	518	329	328	339
Value ...	£ ...	5,366	9,820	9,633	7,155	5,236
Green Limes ...	brls. ...	2,070	1,553	1,165	2,308	4,114
Value ...	£ ...	2,317	2,014	1,758	3,218	5,418
Lime Seeds ...	lb. ...	25,847	7,428	nil	nil	nil
Value ...	£ ...	89	45	nil	nil	nil
Total crop, estimated in barrels of fruit	brls. ...	58,948	30,107	37,345	25,970	46,308
Value ...	£ ...	27,426	29,796	29,531	23,619	26,125

Evidence was provided for the remission of import duty on lime juices and green limes into the United States, as a non-competitive article with the Florida citrus trade. Planting of limes continues generally in suitable districts, as the various products derivable offer advantages over a single product crop such as cacao. Small-holders are active in this connection and usually find a ready sale for their crop to the lime factories. Extension on budded stocks is being made in certain districts; the cost of these however is an initial disadvantage. The reports made show that budded stock is slower in starting, but more robust when established.

COCONUTS.

The coconut crop continues to augment steadily and a record output of 1,114,567 lb. (9,951 cwt.) of copra was exported, an increase of 24% on the previous year. A record number of coconuts was also reaped and shipped, as

shown below for the five year period, being an increase of 37% on the previous year. The total value of exported products was £7,047.

Exports.		1927.	1928.	1929.	1930.	1931.
Coconuts ...	No. ...	96,813	141,667	295,983	268,078	367,350
Value ...	£ ...	349	499	1,032	862	1,178
Copra ...	lb. ...	449,191	705,721	803,889	896,224	1,114,567
Value ...	£ ...	4,449	8,690	9,878	7,428	5,869
Coconut oil ...	gall. ...	3,921	931	nil	nil	nil
Value ...	£ ...	734	184	nil	nil	nil
Coconut meal	lb. ...	15,700	8,994	3,874	nil	nil
Value ...	£ ...	88	38	6	nil	nil

Copra :—The markets were unusually variable during the year owing to the unsettled financial conditions. Prices commenced at £15 10s. per ton c.i.f., rising to £16, and falling rapidly in March—April to £13, corresponding with the closing of certain continental banks and withdrawal of credit. The price in September reached the lowest on recent record at £11 10s. per ton c.i.f., but recovered rapidly following the suspension of the Gold Standard, and closed at £15 17s. per ton.

Enquiries for nuts resulted in a trial shipment of fifty bags of "select" 100's and 110's, and "cull" 150's respectively of $4\frac{1}{2}''$, $4''$ and $3\frac{1}{2}''$ diameter through the Government Market Depot. These were well received in the London market, and netted an average of 8/2 per bag, the gross return being 16/10 per bag. Green and dry nuts were exported to Canada and Bermuda.

With disappearing income, the coconut planters have cut down their staff and expenditure, and economies in wastage are being effected by increased flue-drying. Some of the numerous sun-and-flue-copra driers are, however, of a primitive type and result in scorched and blackened products. The adoption of a model combined drier based on scientific principles as evolved elsewhere is very desirable, and local driers and products are being examined for the substitution of this, and with a view to greater efficiency. A curved form of copra knife as used in the Fiji Islands has proved more efficient than the local type for shelling nuts.

PROGRESS IN THE MINOR INDUSTRIES.

FRESH FRUIT AND VEGETABLES.

The export trade in fresh fruit and vegetables again shows an encouraging improvement on previous records, the mango trade especially being active during the year. The export of produce amounted to £9,943 as against £6,418 for 1930, an increased value of approximately 55%. Of this amount green limes accounted for £5,418 with an 80% increase in exportation, and a large increase in mango exportation is also noted. Comparative records for five years are shown below :—

Fresh Fruit Exports, 1927—1931.

		1927.		1928.		1929.	
		Amount.	Value £	Amount.	Value £	Amount.	Value £
Green Limes	Barrels ...	2,070	2,317	1,553	2,014	1,165	1,758
Grapefruit	crates ...	...	...	83	15	106	21
Oranges	,, ...	66	31	140	50	321	129
Mangoes	,, ...	...	594	...	1,014	...	1,383
Avocado Pears	,, ...	...	56	...	96	...	225
Pineapples	,, ...	...	13	...	7	...	83
Miscellaneous	,, ...	...	1,982	...	2,843	...	1,560
Total	...	...	4,993	...	6,039	...	5,159

		1930.						
		Amount.						
		To Canada.	To Bermuda.	To U. K.	To U.S.A.	To other places.	Total.	Value £
Green Limes	Barrels ...	40	509	66	1,669	24	2,308	3,218
Grapefruit	crates ...	54	163	10	...	19	246	65
Oranges	,, ...	97	299	...	...	...	...	223
Mangoes	,, ...	118	409	24	...	Unknown		915
Avocado Pears	,, ...	111	1,357	...	...	160	1,628	366
Pineapples	,, ...	5	31	2	...	11	49	18
Miscellaneous	,, ...	...	...	...	...	...	...	1,613
Total	...	...	...	...	...	...	...	6,418

		1931.						
		Amount.						
		To Canada.	To Bermuda.	To U. K.	To U.S.A.	To other places.	Total.	Value £
Green Limes	Barrels ...	154	1,832	228	Unknown		4,114	5,418
Grapefruit	crates ...	nil	79	14	nil	Unknown		36
Oranges	,, ...	nil	271	nil	Unknown	Unknown		169
Mangoes	,, ...	204	3,464	68	nil	Unknown		2,172
Avocado Pears	,, ...	34	2,789	nil	nil	Unknown		567
Pineapples	,, ...	1	62	nil	nil	Unknown		23
Miscellaneous	,, ...	...	...	...	...	...	...	1,558
Total	...	...	...	...	...	...	...	9,943

Up to the present the St. Lucia growers have not ventured to any extent in winter vegetable growing, and in this regard are far behind the Northern Islands. Several vegetables can be grown perfectly in St. Lucia, and exported with profit, and good prices can be had during the local dry season when little tropical produce is being marketed. The following brief remarks on produce are made on the Marketing Officer, Mr. A. C. Shill's report, and further verbal information on the Canadian winter demand, which becomes active from December to June.

Tomatoes. A very important trade with good possibilities for expansion. Careful handling, with shipments allocated on the market demand, is important. The St. Lucia crop should be from March to May from December plantings; suitable for the drier lowlands.

Cucumbers. Good prospects from November to May. The green 6"—8" spineless fruit is required. Crop planted in October onwards. A recent quotation was 39/- per bushel crate.

Carrots. An increasing demand. Carrots should be marketed from December to June, February to April being most attractive. The half-long varieties "Chantenay" and "Nantes" should be sown in November and onwards.

Stringless Beans. Very fair possibilities. Arrivals from early November to April; young and small beans needed. A recent quotation given was 7/- per tomato flat crate.

Melons, Papaws, Eggplants, Sweet Peppers and Sweet Potatoes are also marketable with fair prospects. Selection of uniform tubers of "Yellow Jersey" variety sweet potato is advised.

Finally the necessity for pre-cooling produce for shipment is pointedly stressed, in order to ensure satisfactory arrivals. Mr. Shill's report has been circulated to a limited number of growers, and further information is obtainable from the Agricultural Department.

The Bermuda winter trade is being developed during the shorter period when vegetables are scarce there, and shipments of ground provisions, pumpkins, etc., have been profitable during December to June.

Shipments to England can now be made by transhipment at Halifax, thus providing greater refrigeration space and more frequent sailings.

GOVERNMENT INSPECTION AND PACKING FACILITIES.

Inspection of the exported produce under the Fruit Ordinance was continued throughout the year as follows:—Green Limes, 110 barrels and 2,191 crates; oranges, 275 crates; tangerines, 90 crates; grapefruit, 93 crates; Avocado pears, 2,891 crates; pineapples, 63 crates; papaws, 6 crates; mangoes, 3,668 crates; making a total of 9,387 packages inspected during 1931, on which Inspection Fees received amounted to £46 19 7.

The Government Packing House, Cold storage and pre-cooling plant, forming the Government Marketing Depot, was completed and opened in December. By the end of the year it was fitted up with colouring chamber, racks, sizers, etc., and provided facilities and packed shipments for export to the extent of 376 packages, as shown below: Mangoes, 137 crates; oranges, 73 crates; grapefruit, 9 crates; Avocados, 34 crates; tomatoes, 72 crates; coconuts, 50 bags; mixed fruit, 1 crate.

A stock of packing materials, crates, wrappers, wiring, labels, etc., was purchased at bulk prices for re-sale to exporters.

Government ice sales were commenced in October, and this reduced the local price of ice. Insulated storage boxes have been provided in Soufrière, Vieux-Fort and Choiseul, where selling agents exist. The ice latterly made is manufactured from double filtered water. The Cold Storage rates are intentionally low in order to make pre-cooling and cold storage a habit and reduce wastage of food and produce; accommodation exists for ice, dairy produce, meat and general storage, and three fruit rooms are provided, the total capacity being 9,000 cubic feet, the temperatures available ranging from 30° F. to air temperature.

EXPORTS FROM ST. LUCIA, 1931.

		1930.			1931.		
		Quantities.	Value. £	£	Quantities.	Value. £	£
SUGAR PRODUCTS:—							
Sugar, Vacuum Pan	cwt. ...	91,352	45,289		79,460	35,554	
Molasses & Syrup	gall. ...	157,254	2,872		24,837	1,194	
Rum	p. gall.	1,583	278	48,439	...	...	36,748
CACAO PRODUCTS:—							
Cacao	cwt. ...	10,449	19,261	19,261	10,419	14,125	14,125
LIME PRODUCTS:—							
Concentrated Lime Juice	gall. ...	16,050	2,312		10,312	650	
Raw Lime Juice	,, ...	5,140	183		6,961	297	
Distilled Lime Oil	,, ...	954	10,751		1,146	14,524	
Essential H.P. Otto of Limes	,, ...	328	7,155		340	5,236	
Green Limes	brl. ...	2,308	3,218	23,619	4,114	5,418	26,125
COCONUT PRODUCTS:—							
Coconuts	No. ...	268,078	862		367,350	1,178	
Copra	cwt. ...	8,002	7,428	8,290	9,952	5,869	7,047
HONEY PRODUCTS:—							
Honey	lb. ...	37,241	376		38,314	308	
Beeswax	,, ...	196	9	385	643	20	328
BAY PRODUCTS:—							
Bay Oil	gall. ...	189	387		221	500	
Bay Rum	,, ...	10,876	1,792	2,179	5,579	1,043	1,543
SPICES:—							
Nutmegs	lb. ...	11,822	378		6,486	99	
Mace	,, ...	2,160	166		1,131	54	
Kola Nuts	,, ...	15,212	166		9,907	77	
Miscellaneous	,, ...	1,738	30	740	1,389	16	246
VEGETABLE PRODUCTS:—							
Plantains	bchs.	189	14		184	16	
Farine	lb. ...	20,871	163		21,371	115	
Yams	,, ...	5,049	46		...	52	
Miscellaneous	...	...	77	300	...	...	183
FRESH FRUIT & PRODUCTS:—							
Bananas	bchs.	4,568	219		5,364	274	
Mangoes	...	...	915		...	2,172	
Oranges	No. ...	121,344	223		28,166	169	
Grapefruit	,, ...	14,244	65		...	36	
Pineapples	...	...	18		...	23	
Avocado Pears	...	...	366		...	567	
Mixed Fruits	...	...	1,613		...	1,492	
Preserved Fruits	...	...	22		...	...	
Jams, Jellies, &c.	...	...	25		...	66	
Miscellaneous	...	...	...	3,466	...	...	4,799
FOREST PRODUCTS:—							
Boards (native)	c. ft. ...	294	16		543	50	
Cedar	,,	228	37		353	23	
Firewood	cords ...	1,385	669		1,066	466	
Logwood	tons ...	35	93		40	100	
Carried forward	...		815	106,679		639	91,144

EXPORTS FROM ST. LUCIA.—(*Continued*).

	1930.			1931.		
	Quantities.	Value. £	£	Quantities.	Value. £	£
Brought forward ...	...	815	106,679	...	639	91,144
FOREST PRODUCTS—(*Contd.*)						
Pimento Wood c. ft. ...	210	21		...	...	
Hardwood ,,	2,795	251		368	31	
Brooms doz. ...	2,004	88		1,345	44	
Charcoal bags ...	42,324	2,140		39,803	2,031	
Furniture (Household) ...	...	95		...	...	
Miscellaneous ...	...	...	3,410	...	267	3,012
LIVE STOCK & PRODUCTS:—						
Cattle No. ...	2	17		...	...	
Hides & Skins ,, ...	2,420	189		1,895	265	
Shells, Turtle ,, ...	244	171		...	...	
Fish Oil gall. ...	...	...		88	6	
Horses No. ...	45	248		9	53	
Mules ,, ...	1	3		3	28	
Asses ,, ...	7	16	644	18	37	389
MISCELLANEOUS PRODUCTS ...		362	362		1,061	1,061
Total Exports ...			111,095			95,606

AGRICULTURAL OUTLOOK.

The decline in prices of the staple products sugar, cacao and coconuts has reduced total export values for 1931 to £95,606 as against £111,095 in 1930, comparable to the pre-war years of lower production. This would have a much more serious effect on the peasantry through reductions of pay and time, were it not for the works carried out under Colonial Development Fund grants and loans, utilising labour on roads, buildings and sanitary work generally in the Colony; and the fact that peasant food crops can be grown freely for home consumption and thus avoid direct want or any organised dole.

The immediate effect of the suspension of the Gold Standard in October was a general rise in all export values, notably copra, cacao and lime products, and to a lesser extent sugar, which are readily affected by Continental marketing. Prior to this, prices for these products had fallen precipitately on the collapse of certain Continental banks in July. A graph of prices for the year shows striking features. The recovery has been maintained and prices and demand were improving towards the end of the year.

The absence of emigrant work in the Cuban cane-fields has kept more labourers in the Colony and these are urged to develop and take up gardens, rather than casual labour. Tariff impositions on foreign goods into the United Kingdom have given more confidence in the home markets. The outlook for cacao points to decreased production, through elimination in various exporting areas, with a bare margin of stocks and growing consumption, and this should lead to an increased demand as financial conditions recover. The increasing demand for fresh produce in Canada and Bermuda is a further ameliorating factor. Land values at present being low have resulted in several enquiries and visits for estates or Crown lands, and in some change of ownership locally.

PEASANTS' DEVELOPMENT.

The Agricultural Instructor continued to devote practically the whole of his time to travelling among peasants' cultivations, being assisted by the

Agricultural Officer who is now stationed at Soufrière. The development of peasants' crops in the Castries and Dennery districts, and in the Canaries, Soufrière, and Choiseul districts received constant attention, and other districts were visited as often as possible to arouse interest. Practical demonstrations in the small holdings were given on better cultural methods in raising local and export vegetables, and in the planting and staking, pruning and manuring of fruit trees, the making of small pens and preparation of pen manure, the sweating of cacao, intercropping and the introduction of Gliricidia shelter. In the hilly Soufrière district particularly, the advantages of terraced slope were stressed. Meetings of benevolent societies were organised by the Agricultural Officer, and these were well attended, the discussions on orchard work and co-operation with the Department being of much value in promoting closer contact and readiness to follow advice. The demand for orchard plants is strong and cannot be met immediately.

Peasants' Plots.

Ground provisions in larger quantities have been steadily produced in all districts, and pulse crops, onions and garlic have not been neglected, but owing to unfavourable weather conditions, have not increased sufficiently to take the place of imported stuff.

Vegetables for Export.

These were grown well into the dry season at the beginning of the year due to better cultural methods, especially mulching to conserve soil moisture. Plants and seeds of special varieties have been supplied from local nurseries, including tomatoes, eggplant, and sweet pepper, at nominal rates, or gratis in deserving cases.

Cane Farmers.

In the Mabouya valley there was increased activity among the peasants owing to the local Factory resuming cane cultivation and making small advances to metayers and contributions for crop cultivation.

Topworking Fruit Trees.

Topworking of common mango, sour orange and indifferent orange and grapefruit trees with special varieties is steadily progressing in all the districts of the Island, and the effort is thoroughly appreciated by the peasants. Some of the Primary Schools give very useful help in this work. The following schedule shows the present position of the work which is provided for under a Colonial Development Fund grant :—

District.	Mangoes.					Citrus.					Avocados.
	Trees cut.	Trees budded.	No. of buds.	Trees successful.	Buds successful.	Trees cut.	Trees budded.	No. of buds.	Trees successful.	Buds successful.	Trees cut.
Castries ...	3,372	2,364	6,510	1,474	3,274	193	180	335	95	119	4
Dennery ...	1,621	1,088	2,289	461	782	52	(i) 173	187	137	145	7
Micoud ...	304	27	40	18	28	3	(i) 37	37	28	28	3
Vieux-Fort ...	113	11	19	6	11	2	work	not	com	pleted.	—
Laborie ...	90	work	not	com	pleted.	3	(i) 4	8	3	6	—
Choiseul ...	436	(i) 507	1,071	278	522	3	(i) 77	84	58	62	—
Soufrière ...	59	(i) 584	1,409	257	493	2	(i) 112	166	84	91	1
Total ...	5,995	4,581 (i)	11,338	2,494	5,110	258	(i) 583	817	405	451	15
Percentage ...		76·4		54·5	45·1				69·5	55·2	

Mangoes. Total trees successfully budded in 1931 = 2,494 trees or 54·5% of those budded. Total in 1930 = 365. Total under the grant = 2,859 trees. Total trees budded includes (i) additional trees prepared by planters. Percentage of buds successful = 45·1.

Citrus. Total trees successful = 405 or 69·5% of 583 trees budded. Percentage of buds successful = 55·2.

PRIZE HOLDINGS COMPETITION.

A scheme of Prize Holding Competitions on somewhat similar lines to those run in the past has been arranged and circulated throughout the Colony. Some few entries were received towards the end of the year, and more will be made as native suspicion is overcome. The amount of £150 granted from the Colonial Development Fund provides for this extension, which aims at developing the holdings and stimulating interest in vegetable crops and fruit cultivation suitable for the small holder.

The following is an outline of the scheme :—

Prize-money.

£75 per annum for two years.

Districts.

1st year—Castries, Dennery, Soufrière.

2nd year—Other districts not in the 1st year's competitions; or to be decided on the results obtained during the first year.

Conditions.

1. CITRUS.

Larger holdings Citrus Competition—holdings of from above 5 acres to 20 acres of land, owned and not rented.

Crop to be grown. Area planted not less than 3 acres; intercropped or pure citrus.

Either—

Grapefruit: Marsh seedless, Duncan;

or Oranges: Parson Brown, Lue Gim Gong, Valencia Late, or other approved varieties.

or Lemons: Villafranca, Lisbon, Eureka.

or a collection of these Citrus.

1st prize = £5; 2nd prize = £3; 3rd prize = £2.

Total prizes = £10 in each of 3 districts = £30.

2. *Smaller holdings Citrus Competition*—Holdings of 1 acre to 5 acres.

Crop to be grown—Area planted not less than 1 acre—in citrus as above.

1st prize = £3; 2nd prize = £1 10; 3rd prize = £1.

Total prizes = £5 10 in each of 3 districts = £16 10

3. VEGETABLES.

Larger holdings Vegetable Copmetition—owned, rented or leased land; holdings from above 5 acres to 20 acres.

Crop to be grown. Not less than two acres, planted with four of the following:—

Tomatoes—Bonny Best or Globe varieties;
Carrots—Half-long Nantes or Chantenay;
Eggplant—Black Beauty;
Melon—Hales Best;
Cabbage—Golden Acre;
Beans & Peas—Stringless beans and local peas;
Yams—Lisbon, Cush-cush or potato-yams;
General ground provisions—not exceeding ½-acre.

1st prize = £3; 2nd prize = £2; 3rd prize = £1.

Total prizes = £6 in each of 3 districts = £18.

4. *Smaller holdings Vegetable Competition.* Owned, rented or leased land; holdings from 1 acre to 5 acres.

Crop to be grown—not less than 1 acre completely planted with four of the above.

1st prize = £2; 2nd prize = £1; 3rd prize = 10/–.

Total prizes = £3 10 in each of 3 districts = £10 10.

5. Citrus and Vegetable competitors cannot grow both crops on the same spot of land as two exhibits, but citrus may be intercropped and marks awarded accordingly.

6. The plots for competition must be selected and pointed out to the Inspector for entry during his first visit, and no change will be allowed at a later date, except by the Agricultural Superintendent owing to accidental destruction of crops.

7. Plants on holdings must not be more than three years old at commencement of competition, and may be younger.

8. The competitions will be opened for one year in each district and the prizes offered will be distributed as early as possible after judging.

9. On the recommendation of the Agricultural Superintendent any or all of the prizes

may be withheld if the holdings entered are not considered of sufficient merit, and the competition re-opened for a second year.

10. The judging will be carried out by a system of marks being awarded after inspections and visits to the holdings

11. In judging the following points will be considered :—

Citrus Competition.

Use of approved varieties on selected stocks: planting at correct depth and distance; protection from wind, and staking; intercropping with pineapples or other approved crops; draining; manuring and mulching; general cultivation, including control of pests and diseases.

Vegetable Competition.

Use of approved varieties; preparation of land; planting at proper depth and distances; cleanliness and manuring; after-cultivation, including staking and pruning; control of diseases and pests; reaping, handling and crop returns.

ROAD EXTENSIONS AND AGRICULTURAL DEVELOPMENT.

Under the Colonial Grant for road extensions and repairs, the district including the large Millet valley has been opened up for more active development in which peasants are freely participating. This area was inspected by Mr. C. Y. Shephard, Professor of Economics, and by the Assistant Commissioner of Agriculture with the Agricultural Superintendent, and a scheme for a Land Settlement was ultimately prepared. The valley is a fertile and promising one already settled to some extent, and the value of the new road has been demonstrated by motor trucks collecting and marketing provision crops. Certain other areas, namely the Mahaut and Dennery valleys, have been further opened up by extensions or new roads, and information on the agricultural prospects was compiled for use in deciding the routes.

Peasant proprietors and others likely to benefit by the road extensions have been actively ordering plants, principally citrus, and the inspections made confirm the earlier opinion of the suitability of these areas for this crop. In most cases the road haul is under four hours, and citrus fruits properly packed should arrive at the Marketing Depot in satisfactory condition.

AGRICULTURAL INSTRUCTION IN THE PRIMARY SCHOOLS.

REPORT OF THE AGRICULTURAL SUPERINTENDENT ON THE TEACHING OF AGRICULTURE IN THE PRIMARY SCHOOLS OF ST. LUCIA DURING 1931.

The twenty-third annual examination of the Primary Schools in Agriculture was conducted by the Agricultural Instructor between November 2nd and 29th, the number of schools examined being seventeen. The work of the Agricultural classes during the year consisted of exercises in theory and practice on the formation and management of vegetable plots, the propagation of plants, and a general knowledge of the plant and its environment, more frequent visits being made by the Instructor and demonstrations and lectures being given to the pupils and teachers. The general results are satisfactory and an all-round improvement has been noted in the appearance of the gardens and the pupils' comprehension of principles. Better products can be shown.

The following comments deal with matters that need remedying, one of the most important being that of absentees reported on examination day, mainly in the Vieux-Fort, Anse-la-Raye, and Canaries districts, the reason being given as illness. The number taught Agriculture was 635, or 20 per cent. of a total examination roll of 3,076 juvenile boys and girls, and is an increase of 2.5 per cent. on last year's agricultural classes. Of this, however, 21.4 per cent., or 143 pupils remained away on examination day, and whilst this is a small improvement on last year's absentees, which amounted to 213 or 34 per cent. of the class, it is much too high for causes such as illness, there being no epidemic at this time. The results are thus unfair to the Teachers, and in future the examination will be set earlier.

An increase in the number of girls taught Agriculture, 77 as against 43 last year, is noted as a good sign owing to the part they play in later life by keeping the holdings going, during the absence of the men as hired labourers. This teaching should supplement, and not interfere with, that of domestic science. The Instructor reports that girls show great aptitude and can compete with boys in the raising of vegetables and budding and grafting. The useful results obtained in this work are shown in the appended list of plants propagated by the classes.

The Mon Repos garden class has improved under a new master and should shortly reach the standard expected in a purely agricultural district. The Choiseul, Laborie, Ressource, Babonneau and Forestiere Schools are able to supply boys capable of satisfactory budding and grafting, and promising in other operations. In several districts the school garden has attracted the attention of peasants and the rotations are being copied in their own holdings.

Some schools still utilise scrappy, short-lived stocks and primitive forms of vegetables; these should be discarded at once, and good stocks and selected seeds should be procured from this Department. The fruit-bearing sour orange trees are now so scarce that every school should carefully preserve any local trees, in order to obtain seed supplies.

Certain garden sites are quite unsuitable for school gardens, viz., the Castries Wesleyan and Roman Catholic sites, and the Micoud, Saltibus, Soufrière, and Anse-la-Raye sites, most of them representing an important agricultural district. This is very hard on the teachers and classes, and it is hoped that local landowners will follow recent examples and allot half an acre of good land for fresh gardens, in which they indirectly stand to benefit.

Visits to adjoining estates should be made more freely by the classes to gain a fuller appreciation of the principles taught in relation to the main crops. Teachers should also become more active in arousing interest in the Smallholders' Prize Holdings competition, information on which has been circulated and discussed. The peasants' response to this is poor owing to a suspicion of taxation, which is absurd. The sum of £150 is a free gift to the small holders of St. Lucia who show creditable progress in their holdings during the next two years, and teachers should see in this a useful tool to arouse the children's interest in their parents' gardens.

Finally it is hoped that the resumption of lectures annually to the Teachers by the Agricultural Department will become possible, and with the augmented staff and the demonstration work at Union Station, this necessary refresher course should be of increased value.

The following schedule gives the distribution of plants propagated by the Agricultural classes in 1931 :—

Topworking and Plant Distribution from Primary Schools :—

School.	Mangoes top-worked.	Mangoes grafted.	Oranges budded.	Grapefruit budded.	Oranges top-worked.
Castries Anglican Juvenile ...	...	18	26	5	...
Riviere Dorée Anglican ...	2	3	12	8	...
Castries R.C. Boys' Juvenile ...	...	3	3	...	...
Castries Wesleyan Juvenile ...	...	6	6	...	...
La Ressource R.C. Combined ...	12	7	10	1	...
Babonneau R.C. Combined ...	33	5	14	...	1
Dennery R.C. Boys' Juvenile ...	...	16	20	6	...
Soufrière R.C. Boys' ,, ...	...	13	6	...	...
Laborie R.C. Boys' ,, ...	...	11	7	...	...
Micoud R.C. Combined ...	...	10	...	...	...
Choiseul R.C. Boys' Juvenile ...	...	5	12	...	...
Anse-la-Raye R.C. ,, ...	2	12	...	...	...
Forestiere Wesleyan ,, ...	...	...	11	1	...
Mon Repos R.C. ,, ...	5	6	...	1	...
Vieux-Fort R.C. Boys' ,, ...		Vegetable	seedlings		
Canaries R.C. Boys' ,, ...	...	...	...	...	...
Saltibus R.C. Juvenile ...	...	...	...	...	...
	54	115	127	22	1

E. A. WALTERS,
Agricultural Superintendent.

EXAMINER'S REPORT.

Babonneau R. C. Combined.

The practical work in this school has shown marked improvement, and all the boys and girls who were present in the agricultural class on examination day were able to bud and graft economic plants successfully, and a few showed samples of vegetables reported to be grown by themselves at home for market. Successful topworking of mangoes on the school land and in neighbouring peasants' gardens formed a part of their outdoor work.

Liberal applications of pen manure and heavy mulching are necessary to obtain better results in the garden. The theoretical knowledge is satisfactory.

Forestiere Wesleyan Combined.

Budding and grafting operations have improved, but the garden is large enough to produce more sour orange stocks for practice, and also to increase the distribution of these to pupils.

The cultivation of crops such as onions, garlic, ginger, cabbage, carrots, yams and other useful vegetables is practised in a very efficient manner and is of great use as an object lesson to the peasants of the district. The theoretical knowledge is good.

La Ressource R. C. Combined.

The practical work reported on last year has been continued in a satisfactory manner, and includes visits to peasants' holdings for topworking and other operations. The raising of vegetable seedlings for distribution and the cultivation of vegetables such as tomatoes, eggplant, melons, yams and peas, has been performed in a useful manner and serves as an object lesson to the peasants in the neighbourhood. Teachers and pupils are very keen and some of the boys still continue to visit and help in the garden after they have left school. The theoretical knowledge has shown improvement, and this should be kept up.

Dennery R. C. Boys' School.

About one and a half square chains of parish land have been worked in addition to the former small garden around the school, and this has enabled useful crops such as onions, tomatoes, yams, eggplant and other vegetables to be cultivated, on a larger scale, and a large number of sour orange stocks is being grown for budding next year. Conditions for practical work are satisfactory, but visits to peasants' holdings in the Anse Canot district for topworking and other operations could be arranged, and should prove useful to both pupils and peasants. The theoretical knowledge is good, but the answers are too curt; a little more explanation is necessary.

Mon Repos R. C. Juvenile.

A healthy supply of sour orange stocks has been grown, and are ready for budding; this should be attended to at once, and both boys and girls should be taught to practice budding on about two-thirds of these stocks; the remainder could be worked by the few pupils and teachers who can bud successfully for distribution. The soil is poor, and to obtain useful results it requires liberal supplies of stable and compost manures, followed by mulching before the dry weather sets in. The theoretical knowledge is satisfactory in the higher standards, but too stereotyped in the lower standards.

Micoud R. C. Juvenile.

The plot worked at this school is small and sandy and quite unsuitable as a school garden. The theoretical knowledge is very satisfactory, but not sufficiently illustrated by practical demonstrations, though a good deal of box work has been attempted. A better site is necessary before the work attempted can be of real use to the district.

Vieux-Fort R. C. Boys Juvenile.

A piece of land in the Town is worked by the pupils as garden in addition to the wind swept plots around the school, and this has enabled the practical work to include the raising of good crops of vegetables such as tomatoes, eggplants, sweet peppers and beans. This new plot requires a permanent hedge of gliricidia, and stable manure should be applied liberally, followed by heavy mulching to improve the light soil. The theoretical knowledge is good but the answers are too much confined to the actual words from the text book.

Laborie R. C. Boys' Juvenile.

Attention has been paid to the remarks made last year in connection with the laying out of beds and plots in this garden and the re arrangement has changed the whole appearance of the garden for the better. The supply of sour orange stocks for practice in budding has been increased. This is important and should be kept up, particularly as a large number of the agricultural class are country boys who help their parents in their gardens, and can turn this knowledge to good account. The theoretical knowledge is very good.

Saltibus R. C. Juvenile.

Slight improvement has been shown in the agricultural work at this school, but budding and grafting require more attention. This is purely an agricultural district and efforts should be made to obtain a larger piece of land to serve as school garden, and vegetables such as yams, onions, eschalots and garlic should be included in the crops. The theoretical knowledge is very satisfactory, especially in the case of the girls who form fifty per cent. of the class.

Riviere Doree Juvenile.

The standard of agricultural work carried out at this school reflects creditably on the teachers and pupils, the garden having been worked continuously and crops of vegetables raised in a manner that should serve as object lessons to the district. Both boys and girls are keenly interested; budding and grafting are practised on a useful scale. The answers to theoretical questions were very good.

Choiseul R. C. Boys School.

The conditions here have improved, but the sour orange stocks for budding should be planted down the centre of the beds and not placed at the outsides as the district is a dry one. The supply of pen manure is still inadequate and sufficient advantage has not been taken of mulching and compost manure. The garden should be extended as there is land available, and vegetables should be grown on a larger scale. The answers to the theoretical questions were very satisfactory.

Soufriere R.C. Boys' School.

A variety of vegetables are still grown here and attempts have been made to improve the light soil of the garden by liberal applications of stable manure. Visits to neighbouring estates and holdings have been arranged for the class and this should be continued. Budding and grafting operations have received increased attention. The answers to the theoretical questions were good but the boys of Standard IV should be taught to answer using more of their own words.

Canaries R.C. Juvenile.

The Agricultural work in this school should be improved. The layout and work in the garden does not attract the attention of the boys and the crops are rather mixed up. A plan for laying out and working has been arranged with the Head Master and a supply of plants for a new start will be made available by the Agricultural Department. The theoretical knowledge is much in advance of the other branches of work.

Anse-la-Raye R.C. Juvenile.

This garden is situated near the mouth of the Anse-la-Raye river and has frequently been flooded this year; in spite of this repeated attempts have been made to maintain the plot in condition. A small plot of land in the Presbytery yard has been cleaned up and worked chiefly as a source of supply to the main garden when this is severely washed by flood. A good supply of sour orange stocks has been grown and is now ready for budding; these should be attended to at once. The pupils are keen about their work and efforts should be made to provide a better site. The theoretical knowledge is satisfactory.

Castries Anglican Juvenile.

A high standard of agricultural work has been maintained at this school. The garden has been continuously cropped with a large variety of vegetables, cultivated in a judicious manner, and large supplies of sour orange stocks have been raised to provide practice for the pupils in budding. Both boys and girls are keenly interested in their work, and many pupils who have left school are working in gardens near the Town raising vegetables for market. The theoretical knowledge is satisfactory.

Castries R.C. Boys' Juvenile.

The theoretical knowledge of the pupils is very satisfactory. It has already been pointed out that the garden is unsuitable and too small, but box work on an ample scale has been undertaken to help provide practical illustrations for the class work. Good crops of onions, lettuce, yams, and other vegetables have been raised in boxes and cement barrels, leaving the beds of the garden available for raising stocks for practice in budding.

Castries Wesleyan Juvenile.

A very good attempt has been made in the cultivation of crops of onions, eschalots, white eddoes, lettuce and yams in boxes and cement barrels, leaving the remainder of the beds of this small garden for raising stocks for budding, and for certain vegetables. The theoretical knowledge is very good and the pupils are keen about their work. Efforts should be made to provide a better site.

List of Marks and Standing of Schools in Agricultural Teaching.

Schools.	No. of Pupils examined.	Condition and use made of garden.	Practical work and knowledge.	Theoretical knowledge.	Total.	Percentage.	Result Note.
Possible Marks	—	10	10	10	30	100	—
Castries Anglican Juvenile	43(a)	10	10	9	29	96·6	E.
Riviere Dorée Juvenile	16(b)	10	9	9	28	93·3	E.
Castries R.C. Boys' Juvenile ...	78	8	9	10	27	90·0	E.
Castries Wesleyan Juvenile	22	8	9	10	27	90·0	E.
La Ressource Combined	16(c)	9	10	8	27	90·0	E.
Babonneau R.C. Combined	21(d)	9	10	7	26	86·6	V.G.
Dennery R.C. Boys' Juvenile ...	33	9	9	8	26	86·6	V.G.
Soufrière R.C. Boys' Juvenile ...	56	9	9	8	26	86·6	V.G.
Laborie R.C. Boys' Juvenile ...	33	9	8	9	26	86·6	V.G.
Micoud R.C. Juvenile	19	7	8	10	25	83·3	V.G.
Choiseul R.C. Boys' Juvenile ...	56	8	8	9	25	83·3	V.G.
Anse-la-Raye R.C. Juvenile	15(e)	8	8	8	24	80·0	V.G.
Forestiere Wesleyan Combined ...	8(f)	8	8	8	24	80·0	V.G.
Mon Repos R.C. Juvenile	7	8	8	8	24	80·0	V.G.
Vieux-Fort R.C. Boys' Juvenile ...	21	7	8	8	23	76·6	V.G.
Canaries R.C. Juvenile	26(g)	7	7	8	22	73·3	G.
Saltibus R.C. Juvenile	22(h)	8	6	8	22	73·3	G.

(a) including 15 girls; (b) including 5 girls; (c) including 5 girls; (d) including 15 girls; (e) including 9 girls; (f) including 5 girls; (g) including 12 girls; (h) including 11 girls.

R. W. NILES, *Examiner.*

RESULTS OF PUPIL TEACHERS' EXAMINATION IN AGRICULTURE, 1931.

Names.	School.	Maximum Marks 100.
Probationers.		
Charles B. Fricot ...	Soufrière R.C. Boys' Juvenile ...	70
Gregory C. Edward ...	Dennery R.C. Boys' Juvenile ...	60
Leo Hodge ...	Dennery R.C. Boys' Juvenile ...	60
Harold St. Aimée ...	Laborie R.C. Boys' Juvenile ...	59
Jonas Lesmond ...	Dennery R.C. Boys' Juvenile ...	55
Jones E. Mondesir ...	Soufrière R.C. Boys' Juvenile ...	55
Ignatius Antoine ...	Choiseul R.C. Boys' Juvenile ...	50
Rio Fevrier ...	Mon Repos R.C. Juvenile ...	50
O'Kenson St. Ange ...	Canaries R.C. Juvenile ...	50
Kent Hippolyte ...	Castries R.C. Boys' Juvenile ...	45
Julian D. Branch ...	Castries R.C. Boys' Juvenile ...	26
Victor Polius ...	Castries R.C. Boys' Juvenile ...	20
Julius Mondesir ...	Castries R.C. Boys' Juvenile ...	18
Charles Laurenan ...	Soufrière R.C. Boys' Juvenile ...	10
1st Year.		
Willie Andrew ...	Anse-la-Raye R.C. Juvenile ...	75
Hamilton Joseph ...	Riviere Dorée Juvenile ...	57
Joseph A. Paul ...	Soufrière R.C. Boys' Juvenile ...	51
Jonathon Saltibus ...	Saltibus R.C. Juvenile ...	51
Vincent Glasgow ...	Saltibus R.C. Juvenile ...	50
Alex. Hunte ...	Micoud R.C. Juvenile ...	50
Gilbert Stanislas ...	Choiseul R.C. Boys' Juvenile ...	40
Clive St. Croix ...	Choiseul R.C. Boys' Juvenile ...	39
Philip Finisterre ...	Gros-Islet R.C. Juvenile ...	0
2nd Year.		
Jerome Peter ...	Vieux-Fort Boys' Juvenile ...	67
Julius Denis ...	Castries R.C. Boys' Juvenile ...	50
Nelson Paul ...	Vieux-Fort R.C. Boys' Juvenile ...	45
Boniface Edmund ...	Laborie R.C. Boys' Juvenile ...	23

Names.	School.	Maximum Marks 100.
3rd Year.		
J. C. Beausoliel ...	Soufrière R.C. Boys' Juvenile ...	60
Lennox Chalon ...	Choiseul R.C. Boys' Juvenile ...	60
Charles Eugene ...	Castries R.C. Boys' Juvenile ...	41

R. W. NILES,
Examiner.

ADMINISTRATION.

REPORT ON THE WORKING OF THE REUNION ESTATE AND LAND SETTLEMENT.

Land Settlement :—Of the 46 lots comprising the Reunion Land Settlement, 41 have completed payments, making a total sum of £938 11 7. Instalments on the remaining five lots were fairly well collected.

Choiseul Village Extension :—Four more lots in the Extension were sold during the year at the reduced figure of £12. Nineteen lots remain unsold.

The total revenue derived was as follows :—

Instalments on Land Settlement	£4	8	0
Instalments on Village Extension	12	0	0
House Lots and Land Rents	2	12	0
	£19	0	0

CORRESPONDENCE AND DISTRIBUTION OF INFORMATION ON AGRICULTURAL MATTERS.

One hundred and eighty-three Minute Papers and one thousand eight hundred and sixty-eight letters were dealt with during the year ; information was supplied and official returns rendered for the Blue Book ; Imperial College of Tropical Agriculture, Trinidad ; Imperial Agricultural Bureaux, England ; Imperial Institute, London ; and miscellaneous overseas enquirers.

Several reports and publications which were presented to the Library are gratefully acknowledged. The following books were added to the Library :—

"Cultivation of Citrus Fruits" by Harold Hume ; "Manual of Tropical and Sub-tropical Fruits" by Popenoe ; "List of tender Dicotyledons, Kew" and "List of tender Monocotyledons, Kew" ; "The Culture of the Orange and Allied Fruits" by Clarke Powell.

EXPENDITURE AND REVENUE.

Expenditure.

Personal Emoluments	£1,414	3	7
Travelling Allowance to Agricultural Superintendent	100	0	0
Travelling Allowance to Assistant Agricultural Superintendent ...	24	8	0
Travelling Allowance to Agricultural Instructor	120	0	0
Travelling Allowance to Agricultural Officer	50	0	0
Transport Allowance for Visiting Officers of the Imperial Department of Agriculture	10	16	4
Labour, Union and Castries Stations	445	13	8
Seeds, Plants and Manures	126	18	6
Fencing, Gates, &c., Union Station	5	19	8
Transport and Animals	24	17	9
Miscellaneous Requisites	42	10	9
Printing, including Publicity Work and Purchase of Books ...	17	2	3
Minor Repairs to Buildings, Union and Castries	14	18	4
Freight and Transport of Plants	14	8	10
Experiments in Grading, &c., Fruit and Vegetables	17	15	3
Contingencies including Expenditure on Plant Disease	16	0	6
Demonstration Fruit and Vegetable Plot	106	17	9
Experimental Lime Plot at Union Station	103	16	7
Ornamental Plants for C.N. Steamers	21	6	11
Lawn Mower and spare parts	11	15	3
Total	£2,689	9	11

Revenue.

Botanic Gardens, Sales, &c.	...	...	...	...	£38	15	2
Union Station, Sales, &c.	...	...	...	...	105	9	5
Land Settlements, Rents, &c.	...	...	...	...	19	0	0
Total	...	...	...	...	£163	4	7

OFFICIAL VISITORS TO THE STATIONS.

His Excellency Sir Thomas Alexander Vans Best, K.B.E., C.M.G., Governor and Commander-in-Chief of the Windward Islands, and Mrs. Best; Lieut.-Commander G. Marescaux, A.D.C.; His Excellency C. W. Doorly, C.B.E., Acting Governor, and Mrs. Doorly; Professor H. A. Ballou, Commissioner of Agriculture; Mr. G. A. Jones, Assistant Commissioner of Agriculture; Professor Dash, Director of Agriculture, British Guiana, and Mrs. Dash; Professors F. W. Urich and C. Y. Shephard; Dr. Briton-Jones, and 17 students of the Imperial College of Tropical Agriculture; Mr. G. Gianetti; Dr. E. Phillis, Cotton Research Officer, Trinidad; Dr. J. G. Myers, Research Entomologist of the Empire Marketing Board; Mr. R. E. Montgomery, M.R.C.V.S., Adviser on Animal Health, Colonial Office; Professor R. B. Thomson, University of Toronto, and Mrs. Thomson; Mr. A. C. Shill, Marketing Officer; Hon. H. J. Pink, Colonial Treasurer, and Mrs. Pink; Mr. E. S. A. Chin, Agricultural Officer, Montserrat; Mr. K. T. Rae, Agricultural Superintendent, Grenada; Messrs. M. Kisliuk and C. E. Cooley, Entomologists, U.S. Department of Agriculture.

Other Visitors to the Stations.

There was a large number of visitors to the Stations during the year.

STAFF CHANGES.

Mr. E. A. Walters was absent on sick leave from 10th to 20th December, 1931.

Mr. R. W. Niles was on sick leave from 5th to 17th May.

Mr. G. M. Glasgow was on sick leave from 29th to 31st December.

Mr. A. F. Nichols, D.I.C.T.A. was appointed Assistant Agricultural Superintendent from 2nd July, 1931.

Mr. R. du Boulay was absent on vacation leave from 1st to 11th January, and on sick leave from 12th to 25th January and from 26th September to 5th October, 1931.

Mr. W. A. Lewis was absent on vacation leave from 1st July to 31st December.

Miss G. D. Gordon acted as Copyist during the absence of Mr. Lewis.

Mr. Simon Joseph was absent on sick leave from 2nd to 8th May, 1931.

GOVERNMENT MARKETING DEPOT.

Mr. J. R. L. Johnson was appointed Manager of the Cold Storage Plant and Central Packing House on probation from 14th March, 1931.

Mr. J. F. Girard was appointed Clerk and Chief Packer from 23rd March.

METEOROLOGICAL OBSERVATIONS.—APPENDIX I.

STATION, CASTRIES, ST. LUCIA, B.W.I.

LONGITUDE=60° 59′ 49″ W. LATITUDE=14° 0′ 36″ N. HEIGHT ABOVE MEAN SEA LEVEL=10ft.

Month.	Air Temperature.				Absolute Max. and Min.				Relative Humidity % (Glaisher's factor.)		
	7 a.m.	12 noon	5 p.m.	Mean	Max.	Date	Min.	Date.	7 a.m.	12 noon	5 p.m.
January ...	78·0	85·7	78·9	80·8	89	3rd	72	1st	85	60	80
February ...	78·0	85·1	78·3	80·4	89	6th	74	5th	84	60	83
March ...	79·0	86·6	80·4	82·0	91	16th	74	2nd	84	58	80
April ...	78·7	86·6	80·1	81·8	91	1st	74	1st	84	59	80
May ...	78·0	87·6	79·0	81·5	91	1st	74	4th	80	55	80
June ...	78·7	84·6	78·7	80·6	89	2nd	73	6th	84	62	85
July ...	77·8	85·3	79·3	80·8	89	1st	68	28th	84	61	80
August ...	78·8	84·8	78·9	80·5	89	20th	68	2nd	88	61	80
September	78·5	84·5	78·6	80·5	91	20th	68	8th	82	61	80
October ...	78·0	84·3	78·5	80·2	89	12th	68	8th	84	60	84
November	78·0	84·4	78·0	80·1	89	18th	66	21st	83	64	84
December ...	78·0	84·8	78·0	80·3	89	28th	65	2nd	84	61	84
Year ...	78·3	85·3	78·9	80·8	91	16th March	65	2nd Dec.	84	60	82

APPENDIX II.

ht.=3′ 0″ *hr.*=1′ 0″. STATION CASTRIES.

Month.	Rainfall (inches)			Weather.		Wind. No. of Observations of. (at 7 a.m., 12 noon & 5 p.m.)								
	Total	Max.	Date	Days of Rain	Days of Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm
January ...	5·40	1·16	5th	12	0	0	0	85	3	0	0	0	0	5
February	1·74	0·85	7th	6	0	0	0	70	5	0	3	5	0	1
March ...	1·40	0·45	6th	5	0	0	0	87	6	0	0	0	0	0
April ...	3·07	0·42	5th	14	0	0	0	76	12	0	0	0	0	2
May ...	3·48	0·94	24th	13	0	0	0	89	1	0	0	0	0	3
June ...	8·30	1·35	29th	23	0	0	0	79	7	0	0	0	0	4
July ...	18·06	3·38	5th	23	0	0	0	74	10	0	0	0	0	9
August ...	11·05	1·53	10th	22	0	0	0	63	17	0	1	1	0	11
September	11·88	1·55	14th	21	0	0	0	66	10	0	0	0	0	14
October ...	19·45	2·98	24th	19	0	0	0	64	12	0	0	0	0	17
November	13·44	3·35	21st	27	0	0	0	70	9	0	0	0	0	11
December	3.81	0·45	14th	20	0	0	0	68	91	0	0	0	0	6
Year ...	101·08	3·38	5th July	205	0	0	0	891	111	0	4	6	0	83

ht.=Height of therm. above the ground in feet.
hr.=Height of the rainguage above the ground in feet.

MEMORANDUM ON METEOROLOGICAL CONDITIONS DURING THE YEAR 1931, SAINT LUCIA, B.W.I.

Rainfall: The rainfall recorded at the Botanic Gardens, Castries, for the year 1931 was 101·08 inches. This was 32·21 inches above that for the previous year, which was a definitely dry one, and 10·60 inches above the average rainfall for the last 42 years, the average being 90·48 inches. Maximum precipitation for Castries occurred on July 5th when 3·38 inches fell. Maximum precipitation registered for the Colony was 5·62 on October 10th; in this month heavy rain fell generally throughout the Colony, and also in September and November when some floods occurred. The distribution of rainfall throughout the Colony was favourable to most crops, with the exception of cacao estates in the uplands where wet conditions favoured the development of cacao pod diseases. The distribution throughout the year, shown by 39 recording stations, was sharply marked by subnormal rainfall from January to June, and excess rainfall from July until December.

Temperature: Temperature records at the Botanic Gardens, Castries, show a mean noon temperature of 85·3° in the shade. The maximum temperature was 91°; the minimum temperature was 65° a temperature range of 26°. Day and night temperature were generally higher during the dry season—January to June—and lower during the marked wet season—July to December.

Weather: The weather generally was fine, with few storms.

RAINFALL RETURNS, 1931.

Observation Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	Maximum in one day and date.		No. of days on which rain fell.
	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.		
Gros Islet, Reduit Estate	3·47	1·16	0·51	2·38	3·10	4·73	13·60	6·70	11·59	13·94	10·38	2·47	74·03	2·83	Sep. 6th	176
Castries, Corinth ,, ...	3·99	1·75	1·38	4·44	3·44	6·68	15·36	9·85	17·25	18·84	14·42	3·95	101·35	4·43	Nov. 21st	210
Marquis Estate ...	6·32	2·05	2·08	3·06	3·78	3·47	14·85	10·61	16·02	14·13	13·92	3·28	93·57	4·10	,, 21st	215
Union Experiment Station	4·66	1·77	1·76	3·40	3·40	8·28	14·50	13·23	13·22	16·52	11·96	3·74	96·44	3·50	,, 21st	235
Choc Estate ...	4·37	1·68	2·43	3·75	3·21	8·02	14·49	9·48	10·84	15·15	12·44	3·18	89·04	3·47	,, 21st	214
Botanic Gardens ...	5·40	1.74	1·40	3·07	3·48	8·30	18·06	11·05	11·88	19·45	13·44	3·81	101·08	3·38	July 5th	205
The Barracks, Vigie ...	4·38	1·32	1.13	2·39	2·74	7·39	13·37	9·20	11·50	16·73	11·05	3·07	84·27	2·76	,, 5th	224
Soucis Est. Cul-de-Sac	6·20	2·27	1·21	3·59	2·70	8·70	12·33	9·29	8·94	17·15	13·78	4·63	90·79	3·15	Nov. 21st	242
† Crown Lands Est. ,,																
La Perle Est., Roseau	2·54	1·72	0·89	3·99	0·82	11·18	15·82	6·88	12·32	17·50	17·67	4·80	96·13	4·51	Oct. 18th	148
† Mont D'Or Est., ,, ..	...	...	...	...	...	...	...	9·70	12·88	23·41	18·49	...	64·48	3·25	,, 25th	51
† Belair Estate, Roseau	3·66	1·35	1·61	3·13	1·56	9·44	13·67	9·51	11·33	22·39	17·19	...	93·84	3·91	,, 10th	192
Vanard ,, ,, ...	4·03	2·13	2·22	4·39	2·69	13·44	17·17	11·51	13·83	23·70	16·45	5·70	117·26	3·00	,, 6th	186
* Roseau ,, ,, ...	...	2·94	1·00	3·13	0·84	9·44	15·90	9·66	13·27	20·20	12·26	4·23	92·87	5·62	,, 10th	158
Ravine Poisson, Estate	6·70	2·55	4·41	5·72	4·59	10·88	17·18	11·27	16·16	26·34	17·09	4·58	127·47	4·50	,, 24th	122
Soufrière, La Perle Estate	3·49	1·44	1·64	3·64	3·51	13·63	22·54	12·96	13·44	21·17	18·89	5·56	121·91	4·02	,, 25th	237
Ruby Estate ...	2·89	1·38	1·13	3·83	3·17	14·09	20·53	13·15	13·15	21·62	17·43	4·77	117·14	3·90	,, 25th	219
La Dauphine Estate ...	3·12	1·31	1·72	3·86	2·66	12·73	19·68	9·08	14·52	20·69	18·74	4·42	112·53	4·11	Sep. 15th	255
Union Vale ,, ...	2·80	1·05	1·56	3·17	2·82	10·87	19·21	8·96	13·32	21·12	15·01	4·91	104·80	3·80	,, 16th	216
Beausejour ,, ...	5·31	0·42	1·35	4·38	4·20	14·23	23·32	6·25	15·97	26·43	23·29	6·43	131·58	5·23	Oct. 10th	256
* Belle Plaine ,, .	...	...	...	4·61	5·16	14·96	20·41	11·73	15·47	26·09	23·58	6·08	128·09	4·10	,, 10th	243
Choiseul, Morne Lezard Est.	4·89	1·77	1·71	4·48	3·26	13·26	16·90	7·88	12·77	16·60	15·37	3·12	102·01	4·00	Sep. 14th	236
Park Estate ...	4·89	2·05	1·98	4·68	5·11	12·56	17·66	8·64	17·92	23·76	18·33	4·34	121·92	4·95	,, 14th	244
Woodlands Estate ...	5·31	1·72	3·21	5·88	4·27	14·25	19·18	9·24	10·31	30·78	19·62	4·76	128·53	4·94	Oct. 10th	257
Laborie, Londonderry Est.	4·73	1·72	2·76	5·24	3·55	12·92	14·77	8·59	14·70	17·63	12·93	3·61	103·15	5·28	Sep. 15th	242
Giraud Estate ...	5·89	1·85	3·32	2·21	3·55	12·64	16·89	10·39	15·83	22·19	17·72	4·08	116·56	4·80	,, 14th	179
† Black Bay Estate ...	5·26	1·25	1·54	8·29	3·64	11·82	14·41	6·17	10·67	13·60	5·94	1·90	84·49	2·29	June 24th	132
Vieux-Fort, Retraite Est.	4·89	0·85	2·26	3·88	3·69	12·80	13·05	7·64	11·98	15·59	14·17	2·09	92.89	3·05	,, 24th	166
Moule-à-Chique Estate	3·64	0·37	1·26	3·08	2·42	6·71	9·53	3·71	7·93	12·13	7·48	1·22	59·48	2·35	Sep. 15th	169
Beausejour Estate ...	3·44	2·44	2·58	2·64	2·07	9·04	9·95	11·89	9·79	15·05	11·50	1·73	82·12	2·80	,, 14th	188
Pointe Sable ,, ...	3·66	0·81	1·42	2·23	2·41	8·37	12·53	5·54	9·82	13·68	11·11	1·87	73·45	3·11	,, 15th	167
Micoud, Troumassée Est.	2·42	0.30	2·78	4·50	2·78	9·02	12·97	6·36	15·72	19·42	13·19	3·24	92·70	5·12	,, 16th	104
Dennery, † Mamiku Estate	4·21	...	1·35	2·90	3·70	7·35	13·35	6·97	13·65	17·07	10·56	2·11	83·22	4·70	Oct. 10th	268
† Errard Estate ...	...	1·18	1·96	...	...	...	...	...	...	...	...	...	3·14	0·29	Feb. 7th	15
Prospect ,, ...	6·12	2·07	2·58	5·11	5·38	9·12	15·19	9·19	14·58	22·08	18·00	4·10	113·52	4·70	Oct. 10th	266
La Cayé ,, ...	3·27	2·04	2·32	3·34	3·37	4·98	11·27	8·21	11·49	13·03	11·07	3·05	77·44	3·40	Nov. 21st	213
Ressource ,, ...	5·70	2·09	2·10	3·28	4·17	6·89	11·70	8·59	13·38	18·58	13·36	4·05	93·89	4·87	,, 21st	210
Richfond ,, ...	6·15	2·54	2·82	3·28	3·75	6·98	12·42	8·51	13·69	18·34	12·61	3·98	95·07	2·86	,, 21st	209
Border ,, ...	6·51	1·76	2·26	5·30	5·17	8·88	15·59	10·86	14·81	23·98	18·08	4·44	117·64	4·20	Oct. 8th	235

* New Station. † Incomplete.

February 22nd, 1932.

E. A. WALTERS, *Agricultural Superintendent.*

PRICES OF NURSERY PLANTS, ETC.

The prices of plants do not include the cost of the box or baskets, for which a charge will be made, if not returned to the Department.

All prices specified are for plants of standard quality. The prices of plants not included in this list will be fixed by the Agricultural Superintendent.

When nutmegs are supplied by the owner for grafting, a charge of 3d will be made for each plant on delivery.

An addition of 100% is made on the price of all plants supplied for export from the Colony.

No plants are supplied on Public Holidays.

At least six months previous notice must be given when large quantities of such plants as Coffee, Cacao, Nutmegs, Citrus, Cane plants, etc., are required as it is not feasible to keep large supplies of these on hand. At least six months' notice is required for large supplies of Budded Citrus, the sour stock for which have to be specially propagated.

Complaints as to the quality or quantity of plants, etc., supplies, or as to the prices charged, should be made in writing to the Agricultural Superintendent.

PLANTS.

Oranges Budded	6d. to 1/- per plant.
Oranges Sour	1/- to 2/- per hundred.
Grapefruit Budded	6d. to 1/- per plant.
Lime Plants (Seedlings)	1/- per hundred.
Lime Plants Budded/Grafted	2d. to 4d. per plant.
Mangoes Budded/Grafted	6d. to 1/- per plant.
Coffee Plants	1/- to 2/- per hundred.
Cacao Budded	2d. per plant.
Nutmegs Grafted	6d. to 9d. per plant.
Avocado Pear	2d. to 3d. per plant.
Avocado Grafted	2d. to 3d. per plant.
Cane Plants	1/- per hundred.
Pinhapple Plants	1d. to 3d. per plant.
Guava Plants	1d. per plant.
Eucalyptus	2/- per hundred.
Casuarina	2/- per hundred.
Palms (various)	3d. per plant.
Ornamental Plants (various)	2d. to 1/- per plant.
Seeds (various)	2d. to 6d. per packet.
Seeds (vegetable)	2d. to 3d. per packet.
Plants for wind-breaks, hedges, etc., other than the above mentioned	2/- per hundred.

"TROPICAL AGRICULTURE"

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